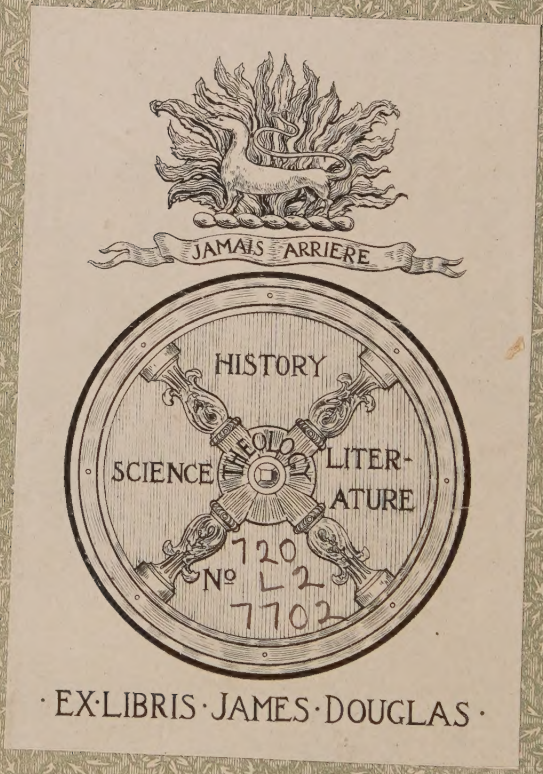
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AN

ENCYCLOPÆDIA

OF

COTTAGE, FARM, AND VILLA

ARCHITECTURE

AND

FURNITURE;

CONTAINING

NUMEROUS DESIGNS FOR DWELLINGS,

FROM THE VILLA TO THE COTTAGE AND THE FARM,

INCLUDING

FARM HOUSES, FARMERIES, AND OTHER AGRICULTURAL BUILDINGS;

COUNTRY INNS, PUBLIC HOUSES, AND PAROCHIAL SCHOOLS;

WITH THE REQUISITE FITTINGS-UP, FIXTURES, AND FURNITURE;

AND

APPROPRIATE OFFICES, GARDENS, AND GARDEN SCENERY;

EACH DESIGN ACCOMPANIED BY

Analytical and Critical Remarks.

BY THE LATE J. C. LOUDON, F.L.S. H.S. G.S. Z.S.

ETC.

ILLUSTRATED BY

MORE THAN TWO THOUSAND ENGRAVINGS.

A NEW EDITION, EDITED BY MRS. LOUDON.

NEW YORK:

R. WORTHINGTON, 770 BROADWAY.

MDCCCLXXXIII.

PREFACE.

In preparing for the press this, the first new edition of the "Encyclopædia of Rural Architecture" that has been printed since Mr. Loudon's death, I have endeavoured, as closely as possible, to act as I think he would have done if he had been alive. I have carefully read over and corrected the whole work, and I have made a few additions to the Supplement, most of which, however, were either prepared or indicated by Mr. Loudon shortly before his death. The only part of the present edition with regard to which I have acted entirely on my own judgment, is in re-writing the Glossarial Index, and giving the explanation after each term, instead of merely referring to the paragraph where it might be found; and I have done this because I have heard complaints frequently made of the difficulty of finding the explanation of the terms, from the great length of the paragraphs referred to.

J. W. LOUDON.

PREFACE

TO THE FIRST EDITION.

All the arts of life have had their origin in some simple natural want, supplied, in the first instance, by every man for himself; till, with the progress of civilisation, from these wants sprang those desires and wishes, which gave rise to that division of skill and labour in supplying them, which is one of the characteristics of civilised society. Hence the origin of all the different professions, most of which, in their first existence as such, were practised by distinct associations as mysteries, unknown to, or concealed from, general society.

It is in the nature of all knowledge held as mystery, to remain in a great measure stationary, because the minds which are engaged in it are necessarily few; and because the great object of such associations is, to keep their peculiar knowledge, and the exercise of their craft, among themselves. Hence the little progress which has been made in Domestic Architecture, the science and rules of which have been almost exclusively confined to Architects, from the earliest ages to the present time. On examining into the actual state of this art, it will be found that the improvements which have been made in it in modern times, are chiefly confined to those departments which are open to the understanding, and amenable to the judgment, of mankind generally; we mean, such as relate to comfort and convenience in the arrangement, warming, lighting, heating, &c., of rooms; whereas the department of taste in building is little in advance of what it was two thousand years ago.

To what can this be owing, but to the circumstance, that the knowledge of Architecture, as a fine art, is much less familiar to the public, than it is as an art of utility; or, in other words, that the Architect is under the control of public opinion much more in matters of usefulness, than in matters of taste?

This is a state of things by no means peculiar to Architecture. The greater portion of mankind, in even the most civilised countries, has hitherto been kept in the dark with regard to what constitutes truth and excellence in all arts or professions, the practice of which has been limited to certain associations or corporations of individuals. Hence the sciences of government, law, medicine, theology, education, &c., have been in all countries comparative mysteries, and have, consequently, like Architecture, remained nearly stationary for ages. The profound and exclusive attention, which is requisite to enable the professors of any art to become eminent in it, necessarily precludes them, while engaged in its pursuit, from acquiring a proportionate stock of knowledge upon other subjects. Unless, therefore, this stock of knowledge has been previously laid in by a scientific education in early youth, professional men and artists are very apt to assign an undue importance to the facts and views connected with their professions; and to regard as general truths, those which are, in fact, only particular. Hence, universal principles and extended views are much more likely to be entertained by persons who have studied several arts and sciences, though perhaps none of them profoundly, than by those who have confined their attention to only one. Hence, also, we rarely find great reformations made in any art by its professors.

Another cause which has retarded the progress of all arts and professions is, the practice, common in most of them, of implicitly following precedents; or of adhering rigidly to rules (made perhaps in a former age, and consequently adapted to a less advanced state of civilisation), instead of testing those precedents and rules by fundamental principles, and adapting the latter to the state of society for the time being. No art has had its progress more retarded by these means than Architecture; whether by the old idea that the whole of its science was included in the knowledge of the five orders; or by the modern one that Architecture, as an art of taste, is one of imitation, like those of sculpture and painting; and that there is no manner of building worthy of the name of Architecture but the Grecian.

According to our views of this subject, all arts, whether of design and taste, or of utility and convenience, like every thing else relative to man, are progressive, and change with the changing condition of society. In like manner, the knowledge of all arts, from being exclusive, is calculated, through the spread of education, ultimately to become universal; and, the art of printing and the use of the steam-engine being discovered, the time will ultimately arrive, in every country, when all knowledge will be common to all

mankind. No art or profession will then be a mystery; but, each being reduced to the comprehension of youth, forming a part of that general education which will ultimately be every where established, and being consequently subject to the criticism of the whole of society, the improvement in it will be great, in proportion to the demand which there may be for its exercise and for its productions. Though scarcely any country has arrived at this stage in social progress, even in any one of the arts or professions, yet all countries are advancing towards it with different degrees of rapidity, according to the circumstances in which they are placed, geographical and political.

In accordance with these views, our intention, in producing the work now submitted to the reader, is, to prepare the way for rendering general, a knowledge of Domestic Architecture; for the immediate purpose of increasing the comforts of the great mass of society; and for the more remote objects of improving the knowledge and the taste of the public in Architecture, and of inducing Architects to study their art on general principles, and on a theory formed on the nature of the human mind, and on the changing condition of society, rather than on the precedents and rules of former ages, or on any hypothesis whatever. The means by which we have endeavoured to effect these objects will be found explained at length in our Introduction, to which we refer the reader.

We have only been enabled to accomplish our purpose by the cooperation of a number of Architects, of scientific men, and of men of taste. Several of these we are proud to call our personal friends; and others, who, before we received their contributions to this work, were known to us only by name, have proved themselves friends by their actions. Before proceeding to return our sincere acknowledgments to the various artists and others, whose names will be found in the list, p. xix., it may be advisable to reply to an objection which has been made to us by some Architects, viz. that, by laying their profession open to the world, we were acting so as to injure their pecuniary interests. The same objection was made to Dr. Buchan many years ago, when he first published his *Domestic Medicine;* and to John Abercrombie, when he wrote his book entitled *Every Man his own Gardener.* Now, without going into details, we shall only ask, what have been the progress of medicine and gardening, and the prosperity of medical men and gardeners, since the time these works appeared, compared to what they were for a similar period previous to their publication? The answer, undoubtedly, is, that their improvement has been great beyond all former example. To what can this be owing, but to the more general diffusion of knowledge on these subjects? The truth is, that public attention can never be turned to any art or science, without benefiting all its professors. A little knowledge of any given subject makes us desire to know more; and, though we first apply to books to acquire this further knowledge, we must ultimately have recourse to living professors to carry it into effect. No book can be framed so as to suit the exigencies of every particular case: all that can be done by any author is, to lay down general principles, and to deduce rules from them. The application of these rules must be learned from experience; and it is evident that a knowledge of the principles from which they are deduced will enable the amateur more thoroughly to appreciate and profit by the skill of the professor.

Among the important uses of this work will be that of pointing out the various capacities for improvement in comfort and beauty, of which each class of building, and each kind of furniture, is susceptible. Now, so far from this having a tendency to injure Architects, it will not only enable those who wish either to build or to furnish, to express more clearly, to the Architect or upholsterer, those wants which they already have; but it will elicit new ones, of which they had previously no idea, and which the Architect, the builder, and the upholsterer will be called upon to supply.

In expressing our acknowledgments to our contributors, it was originally our intention to thank, in an especial manner, those who, by their early contributions, when the work was commenced in monthly parts, in April, 1832, encouraged us to proceed with it; but, on due consideration, lest we might inadvertently appear partial in our acknowledgments, we think it best to return our sincere thanks generally to the whole of our contributors as enumerated in the list, p. xix. to xx. How much we feel indebted to the Architects and others, whose names are included in that list, can be only understood by those who are duly aware that the value of a work consisting principally of graphic designs, depends upon those designs being the production of a number of different minds. For the liberality which has been thus shown us, we have made the best return in our power, by publishing this work at such an unprecedentedly low price, as must insure, to the names and talents of our contributors, an extensive circulation; and, for our own labour, we have earned the consciousness of having produced a book, which must inevitably have an important influence on the rural Architecture of the temperate regions of both hemispheres.

Bayswater, June 1. 1833. J. C. L.

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we may not all at once succeed to our utmost wishes. In ameliorations necessarily involving considerable expense, much cannot be expected to be performed immediately; yet, by making known the various particulars in which these ameliorations consist, to those who are to derive important benefits from them, we may rest certain, that, sooner or later, they will be effected. The efforts of Architects, in all ages and countries, have hitherto been, for the most part, directed to public buildings, and to the mansions of princes, noblemen, and men of wealth; and what have hitherto been considered the inferior orders of society, have been, for the most part, left to become their own architects. Hence the tardiness with which the improvements made in the accommodation, arrangement, and exterior beauty of the mansions of the wealthy, have found their way to the dwellings of the poor. The great object of this work is, to show how the dwellings of the whole mass of society may be equalized in point of all essential comforts, conveniences, and beauties.

By implanting in the minds of general readers, and especially of the youth of both sexes, some knowledge of the good and bad of Architecture, as an art of Design and Taste, it is evident that this main object will also be promoted. Teach the young what architectural beauty is, and they will admire it; show them how it may be produced in their dwellings, and they will desire to possess it. Whatever is generally and ardently desired, and unremittingly pursued, is certain of being ultimately obtained

Independently of the usefulness of the study of Architecture, its pursuit, as a fine art, recommends itself, like the study of painting and sculpture, as a rational source of intellectual entertainment; easily indulged in, since buildings occur every where, and form one of the principal sources of interest in all towns and cities, and in travelling. The great use of the study of any of the fine arts is, to polish and refine the taste, and divest the mind of vulgar and common-place feeling. Architecture is the only fine art open to the inspection of all, and interesting to all; and could we only succeed in raising the taste of the mass of society in this art, we should not only effect an universal improvement in Architecture, but materially contribute towards the universal adoption of correct and elegant habits of thinking and acting generally.

As the buildings of every country are open to all its inhabitants, it may be asked, why all have not already a correct and elegant taste in this art? To this we answer, by asking how it happens that all persons have not a correct knowledge of their native language; or a good taste in written compositions? The truth is, that but a very slight knowledge of any subject can be obtained without studying its first principles. There is a grammar in Architecture which must be taught, no less than the grammar of language; and when that grammar is mastered empirically, there remains to be acquired the principles of human nature, upon which its rules are founded. It is on Architecture, as founded on these principles, that we chiefly rest our hopes of creating a general taste for the art, and of rendering architectural criticism as common among all classes of society, as the criticism of general literature.

"It is not," says a clever architectural writer, (*Foreign Quarterly Review, April*, 1831,) when advocating the study of Architecture by women, "in order that they may be able to draw columns, for that is merely the means, not the end of the pursuit, that we would suggest the propriety of ladies applying themselves to what has hitherto never been included within the circle of female acquirements; but that they may thereby cultivate their taste, and ground it on something less baseless and shifting than mere feminine likings and dislikings. And when we consider how wide is the province, how influential the authority, which the sex are apt to claim in such matters; how much, in all that regards ornamental furniture and interior embellishments, depends on the refined or trivial taste of our fairer halves; it must be acknowledged that to initiate them into such studies would not be an act of perfect disinterestedness." Independently of its subsequent advantages, the study of the Grammar of Architecture, or, in other words, "the elementary practice of architectural drawing, would be highly beneficial to the youthful pupils, inasmuch as it affords an immediate application of the simpler principles of geometry; as it forms the hand to correctness, the eye to a scrupulous examination of forms, and, consequently, implants habits of careful deliberation and attention, as well as the seeds of taste."

We entirely agree with this writer in his opinions of the influence which women would have on the public taste in Architecture; believing, as we do, that the improvement which, within the last fifty years, has taken place in landscape gardening, is, in a great measure, owing to the more general adoption of the art of sketching landscapes from nature, as a branch of female education. If the study of landscape drawing, by ladies, has led to the improvement of landscape gardening, w y should not the study of architectural drawing, on their part, lead to the improvement of domestic Architecture?

The influence of Architecture on taste and morals has been argued, in a masterly manner, by Dr. Dwight, when speaking of what he saw of its influence in the towns of New England. Speaking of a city which had, when he saw it, in the beginning of the present century, been twice ravaged by fire, this admirable author observes, that though the tenants of the houses which were burned were, in many instances, sufferers, yet the town and the proprietors gained much. "The town," he says, "has already been improved not a little in its appearance, and will probably be much more improved hereafter. There are persons who will imagine this to be a matter of little consequence. I wish them to consider for a moment the following hints:—

"There is a kind of symmetry in the thoughts, feelings, and efforts of the human mind. Its taste, intelligence, affections, and conduct, are so intimately related, that no preconcertion can prevent them from being mutually causes and effects. The first thing powerfully operated on, and, in its turn, proportionally operative, is the taste. The perception of beauty and deformity, of refinement and grossness, of decency and vulgarity, of propriety and indecorum, is the first thing which influences man to attempt an escape from a grovelling, brutish character; a character in which morality is effectually chilled, or absolutely frozen. In most persons, this perception is awakened by what may be called the exterior of society, particularly by the mode of building. Uncouth, mean, ragged, dirty houses, constituting the body of any town, will regularly be accompanied by coarse, grovelling manners. The dress, the furniture, the equipage, the mode of living, and the manners, will all correspond with the appearance of the buildings, and will universally be, in every such case, of a vulgar and debased nature. On the inhabitants of such a town, it will be difficult, if not impossible, to work a conviction, that intelligence is either necessary or useful. Generally, they will regard both learning and science only with contempt. Of morals, except in the coarsest form, and that which has the least influence on the heart, they will scarcely have any apprehensions. The rights enforced by municipal law they may be compelled to respect, and the corresponding duties they may be necessitated to perform; but the rights and obligations which lie beyond the reach of magistracy, in which the chief duties of morality are found, and from which the chief enjoyments of society spring, will scarcely gain even their passing notice. They may pay their debts, but will neglect almost every thing of value in the education of their children.

"The very fact, that men see good houses built around them, will, more than almost anything else, awaken in them a sense of superiority in those by whom such houses are inhabited. The same sense is derived, in the same manner, from handsomer dress, furniture, and equipage. The sense of beauty is necessarily accompanied by a perception of the superiority which it possesses over deformity; and is instinctively felt to confer this superiority on those who can call it their own, over those who cannot. This, I apprehend, is the manner in which coarse society is first started towards improvement; for no objects, but those which are sensible, can make any considerable impressions on coarse minds. On these grounds I predicted to my friends in this town a speedy change for the better in its appearance, and in the character and manners of its inhabitants. I have since seen this prediction extensively fulfilled."—*(Travels in New England*, vol. ii. p. 202.*)*

"The connexion of Architecture with the other fine arts," says the critic, in the Foreign Quarterly Review, "and the convenience of knowing at least as much of it as will enable us to judge how far the accessories in a picture are correct, where buildings are introduced, are too obvious to be insisted upon; neither is it necessary to expatiate on the superior advantages possessed by the traveller who has qualified himself, by a competent study of the subject, for enjoying the local beauties of the cities he visits. It might be conceived that the additional interest which an acquaintance with the various styles of Architecture imparts to historical studies, and the kind of *memoria technica* furnished by the various reminiscences connected with celebrated buildings, would alone form a sufficient reason for directing the attention of the youthful pupil to such studies."—*Foreign Quarterly Review, April*, 1831.

"He who criticises every fine building which he sees," observes one whom we consider the most philosophical of British architectural authors, "with a sincere desire to find out whatever in it is excellent, bringing everything to the test of his own unbiassed feelings and judgment, will form to himself a habit, profitable, not only when applied to Architecture, but to every subject on which the human understanding is exercised."—*Wood's Letters of an Architect, Preface.*

By the principles of Architecture, many persons understand nothing more than certain established rules and precedents, drawn from the ancient buildings of Greece and Rome; and, for the greater part, comprehended in the study of the orders used in Grecian and Roman temples. 'Are not those orders everything—the all in all of Architecture?' say such persons. "The whole science," observes the critic before quoted, "is commonly

thought to consist in knowing a few cabalistic words derived from the Greek, and a few mechanical rules for the proportioning of columns; while, for those who would wish to acquire such a knowledge of Architecture, as would enable them to appreciate its beauties as they do those of its sister arts, there is hardly a single elementary work, that is not either too superficial, or merely technical. Instead of anything like generalization of principles, or originality of views, we meet with insulated rules, and the dull quackery of monotonous routine: while peurile trifling, or anile superstition, is suffered, in many cases, to exclude even a glimpse of common sense. In almost every other branch of knowledge, the student is able to provide himself with theoretical and critical, as well as practical, works; but here, he ought to be endued with more than ordinary ardour and perseverance, if he would collect for himself the insulated scraps of criticism, and the few really useful, original remarks that, 'few and far between,' are scattered over a wide expanse of almost unvaried sameness."—*Foreign Quarterly Review, April*, 1831.

But a knowledge of the rules of Grecian Architecture, can no more be considered the principles of the science, than the art of mixing colours can be called the principles of painting. "The great object of an Architect," says Wood, "is to determine in what manner, with means always in some degree limited, either by the nature of the material to be employed, the customs of the country, the expense, or the taste or no taste of the employer, he can combine beauty with utility. The connexion of beauty, as an effect, with the composition of the parts of buildings, as the cause of that effect, is the great end and object of the Architect."—*Letters of an Architect, Preface.*

After studying with care all the various opinions delivered by different architectural writers on the subject of the principles of their art, and divesting ourselves, as much as possible, of all accidental associations and temporary prejudices, we have arrived at the following conclusion:—that the leading principle of Architecture, as a useful art, is fitness for the end in view; as an art of design, expression of the end in view; and, as an art of taste, expression of some particular Architectural style. Those beauties or effects which are the result of the first and second principles, are in their nature permanent; those which are the result of the third principle, are in their nature temporary and accidental.

All the various principles which come into operation, in the design and construction of buildings, easily range themselves under these three fundamental principles. The fitness of a design for the end in view, comprehends, not only the fitness of the size, shape, number, relative position, and other particulars of the interior divisions of a building, for the uses for which they are intended; but the fitness of the materials and construction, with reference to the strength and durability which may be required; and the fitness of the expenditure for the means at the command of the builder. In like manner, the principle of the expression of the purpose, or end in view, applies not only to unity of expression in a building as a whole, but to the separate expression of all the different parts of a building for the purposes for which they are intended. So also the expression of architectural style applies, not only to the building taken as a whole, which must be in the same style throughout, but to all its component parts, which, even to the most minute details, must belong to that style, and exhibit its characteristics.

Thus, as there are various uses to which buildings are devoted, so are there various kinds of beauty of which they can be rendered expressive. But, as all the uses to which buildings can be applied, all the arrangements which are requisite for convenience or luxury, and all mechanical or chemical processes which enter into their construction, are referable to the principle of fitness; so all the different kinds of beauty of which they are susceptible, are referable either to the expression of purpose, or to the expression of style. A cottage or a barn, which are recognized to be such at the first glance, are so far perfect, as to the expression of purpose; but they may also be specimens of Grecian or Gothic Architecture, in which case, to the expression of purpose is added the expression of style.

As fitness and the expression of purpose are principles applicable to all buildings whatever; so fitness, the expression of purpose, and the expression of architectural style, comprehend all the beauties of which buildings are susceptible.

The principle of expression of purpose, is of universal application in Architecture; and whatever building will bear the test of examination according to it, cannot but prove satisfactory to every unprejudiced mind, though it may not possess any of the beauties of architectural style. The minds of all men, however, are more or less subject to the prejudices of the age and country in which they live; and the prejudices of European Architects and their employers, seem long to have been in favour of the expression of architectural style in building, rather than of the expression of use or purpose. This circumstance has influenced the general taste; and hence it is, that the critical observer,

when looking at what is considered a fine building, instead of first examining whether it is expressive of the purpose for which it is applied, considers only whether it is intended to be in the Grecian, Roman, or Gothic style; and, having determined to which of these styles it belongs, he next examines whether the details of the building are in strict conformity with the best practice and precedents in that style. But according to the principles we have laid down, it will be seen that the Grecian and Gothic styles are mere accidents in Architecture; and are nothing more than the language which the Architect makes use of to convey his ideas. The expression of the purpose, for which every building is erected, is the first and most essential beauty; and should be obvious from its Architecture, altogether independently of any particular style; in the same manner as the reasons for things, are altogether independent of the language in which they are conveyed. As in literary compositions, no beauty of language can ever compensate for poverty of sense; so, in architectural composition, no beauty of style can ever compensate for the want of expression of purpose. Every reasonable mind must feel this; for, as we have said before, the foundation of all true and permanent beauty is utility.

But though it is necessary to study the expression of purpose, as the first and fundamental beauty in all Architecture, it is by no means either necessary or advisable to neglect the study of style; on the contrary, the judicious artist will take advantage of the prejudices in favour of this kind of beauty already fixed in the minds of mankind, and will employ it, so as to co-operate with and heighten the expression of purpose; because there are many persons who can admire the beauty of style, by whom the more simple and universal beauty of expression of purpose, would neither be relished nor understood.

Most authors, from Vitruvius to the present time, divide the subject of Architecture into use and decoration; and, by decoration, it is evident that they mean what we denominate style; though scientifically considered, style and decoration are essentially different. Any building may be decorated, by fixing on it ornamental objects of different descriptions; but for a building to be in a particular style, all its principal parts must be characteristic of that style, and must co-operate in producing one effect, or expression.

Another class of architectural writers, Laugier, John Wood, Milizia, and especially Quatremère de Quincy (whose opinions have been adopted by a number of English writers, without the slightest acknowledgment), maintain, that Architecture, in so far as it is an art of taste, is to be considered an art of imitation. According to this doctrine, the type of the Egyptian Architecture is a cavern; of the Chinese, a tent; of the Gothic, a grove of trees; and of the Grecian, a rectangular hut. An opinion of this sort, adopted by such a profound metaphysical author as Quatremère de Quincy, deserves to be examined with the utmost attention. That there is truth in it, cannot be denied: man, whether in a state of barbarism or of civilisation, is alike an imitative animal; that is, he cannot act otherwise than according to general laws, which have influenced all his predecessors from the earliest ages, and which will control all his posterity to the latest period. To say, however, that Architecture is an imitative art, like the arts of Painting or of Sculpture; that is "purely imitative," as Mr. Elmes calls it in his Lectures, strikes us to be by no means a correct use of language. That the more ancient of the different manners of building have had their origin in certain rude types, there is very little doubt; at all events, this is sufficiently clear with respect to Grecian Architecture, all the principal members of which may be traced to the props and roof of a hut constructed of timber: but where is the type for the semicircular arch? But why should a people, living in a country where stone was almost the only building material, be induced, by the instinct of imitation, to adopt a mode of building suited only for a material altogether different? May not a stone or mud hut serve as a model, as well as a wooden one? If Egyptian or Indian Architecture may have had its origin in caves or excavations in the face of an upright rock, and Grecian Architecture have taken its rise from a rectangular hut, why may not Gothic Architecture have had its type in the conical huts of turf and stone, or of sticks and mud, formed by the northern nations of Europe? We think this, at all events, just as likely to have given rise to Pointed Architecture, as a tent to that of the Chinese.

The origin, however, of the different styles of art, appears to us a matter of very trifling importance. All Architecture may be reduced essentially to two kinds; viz. that where the openings are covered with horizontal planks or blocks; and that where they are covered with arches, either curved or pointed. Now, provided a system founded on any of these three principles be developed in a uniform, harmonious, and consistent manner, with reference to strength, durability, and fitness for the end in view, and to the general laws which govern all compositions of lines and forms, what objection can there be to it, in any reasonable mind? On the other hand, supposing an Architect to take any of the alleged

types as the foundation of his system, to what kind of result would he attain, without the exercise of reason at every step? Without reason, indeed, and that too continually exercised, Architecture would be an art of absurdity. As well, in our opinion, might agriculture and gardening be called imitative arts, as the art of Architecture; because there must have been some origin for cultivation as well as for building. The truth seems to us to be, that, viewed with reference to their origin, all arts are imitative; and, with reference to their adaptation to the state of man for the time being, all arts are founded on reason or human improvement.

How far Architecture is to be considered one of the fine arts must, as it appears to us, (and our opinion is in consonance with that of Alison, Dugald Stewart, Sulzer, and other writers) depend, not on its being either an imitative or an inventive art, but on its powers of creating in the mind, emotions of sublimity or beauty.

Notwithstanding the seeming difference of opinion on this subject among architectural writers, it appears to us in the highest degree probable, that, if the language of each writer were explained with reference to one fixed standard, they would all be found nearly to agree; the expressions, "art of imitation," and "art of imagination," being used by many of them as synonymous. At all events, hypothetical differences of this kind should never prevent us from profiting by the excellent works of such writers as Quatremère de Quincy and Milizia.—But it is time to turn from a speculative digression to the main purpose of this introduction, which is, to explain the general nature of our work.

1. *Our grand object being to introduce improvement* into Cottage, Farm and Villa Architecture, in the temperate regions of both hemispheres, by numerous examples of Designs, with different degrees of accommodation, and in different styles of Architecture, we have adopted, as the first term in our ascending series, a simple dwelling of two rooms, suitable for a man and his wife, without children; and, as the last term, the villa or country house of an English gentleman of wealth and refinement. We have fixed on the English villa, as combining more of the comforts and luxuries of life than the villa of a man of wealth and taste in any other country in the world.

2. *The first step towards the introduction of improvements* in the practice of any art, is to familiarize the minds of the practitioners with the deviations from usual practice which constitute these improvements. In rural Architecture, almost the only means of doing this is by published Designs; for no local builder can be supposed to have had either leisure or opportunities to inspect the various improvements which have taken place throughout his own country, and in other countries. Unless he has recourse to books of Designs, therefore, he can do little more than repeat himself, or copy what he has seen; probably with some improvement—possibly with deterioration. To supply the country builder, therefore, with numerous Designs, at a moderate price, must be rendering him an acceptable service.

3. *The use of published Designs to an experienced Architect* is to furnish him with ideas for composition; that is, with different modes of connecting the various parts of which a building is composed; of varying the forms of those parts; of devising new forms from them; and, finally, of composing the exterior as well as the interior details; subject always to the guiding principle of unity of expression, whether of purpose or of style.

4. *The same use of published Designs may be made by a young Architect;* but in order that he may profit to the fullest extent, either from viewing buildings actually executed, or from studying published Designs, he should be able to analyze them, and to trace the cause of whatever they may display of the beauties of fitness, of expression, or of style, to first principles of composition. To assist him in doing this is the object of the analytical remarks which we have made on each Design. The amateur Architect, and general reader, will also find these remarks useful as a means for improving their taste, by enabling them to refer the beauties or defects of buildings to their true causes. This is, indeed, the chief use of Designs to a general reader; but an Architect or builder may profit much from the careful inspection of a book of Designs, merely as a collection of models, without being able to analyze them; or to trace the causes of the pleasure or dislike, which he may receive from them, to first principles. Such an Architect, or builder, however, though he may be a very efficient empirical practitioner, can never be considered as possessing a scientific knowledge of his art. "The uneducated Architect," says Wood, "judges by his feelings; the half-educated, by rule; but the master, from feelings, trained and purified by study and reflection."

5 *In delineating these Designs*, we have, instead of geometrical elevations, given in every case, correct perspective views; and we have not accompanied these views by trees, or landscape scenery of any kind, considering the practice of doing so as of no real use; and, on the contrary, as calculated to mislead the inexperienced eye. For, as the beauty of every whole, is necessarily made up of the beauties of all its component parts; and as the size and shape of the trees, and the style of the scenery which form conspicuous parts in pictorial views

of Designs for buildings, are beyond the power of the Architect, whatever part of the effect of the picture depends on them, cannot be realized in the execution. In every landscape composed of a house surrounded by verdant scenery, the beauty or deformity of the house may easily be heightened or obscured, at the pleasure of the artist, by the management of the other parts of the picture; but where a building is exhibited in perspective by itself, its beauties or deformities are more easily detected; and the latter can be corrected before proceeding to carry the Design into execution. If, indeed, the introduction of verdant scenery in the picture, would serve as a guide for planting and arranging the ground about the house, then, indeed, it would not only be allowable, but advantageous; but every landscape gardener knows that instruction in this department can only be conveyed graphically, by plans and sections of the surrounding grounds, showing the disposition of the trees and shrubs to be planted, and enumerating their kinds.

6. *The Details of Construction, or Specifications,* as they are technically called, which accompany some of these Designs, are for the purpose of assisting the young Architect in making out similar Specifications for all the rest; and also for instructing the employers of Architects and builders, as to the sort of details which ought to be entered into and settled, before any building, however small, is undertaken to be executed. Engravings on wood, of the details on a large scale, are given with each Design, for the like purpose of facilitating execution.

7. *The Estimates,* with the exception of those cases, in which detailed Specifications are made out, can only be considered as approximations; but as, in every case, the data are given from which the estimate has been made, an experienced builder, who knows the difference between the price of labour and materials in his own locality and that of London, will always be able to calculate from these data, so as to form an estimate sufficiently accurate for general guidance. Every builder, or even carpenter, when he has laid before him a plan, a perspective or isometrical elevation, and a section, such as we shall give, can make out a specification of the details of construction, on which he can form an estimate suitable for contract and actual execution.

8. *In the Analytical and Critical Remarks on each Design,* we have illustrated all the different kinds of construction, and all the principles of architectural composition. In doing this, we have preferred, as the most useful mode, and as the one least likely to restrain the freedom and extent of our remarks, to give such details, and offer such criticisms, as naturally arose out of the subjects as they came successively under review, without much regard to the order of their succession.

9. *In illustrating the Principles of Landscape Gardening, as connected with Buildings,* we have, in like manner, limited ourselves to the development of one principle at a time; showing, in some cases, how the ground ought to be disposed in the neighbourhood of a building; in others, how it ought to be approached by roads or walks; sometimes, how fences ought to be disposed; and, in various cases, not only how the trees or shrubs ought to be arranged, but the particular situations for different sorts, with the different heights to which they grow, the soils they require, their suitableness for particular climates, and their character as ornamental, useful, or fruit-bearing plants.

10. *Plans of small Gardens* have been given along with several of the humbler Designs; and, in describing these, we have not only shown how they may be planted, with fruit and ornamental trees and shrubs, to most advantage; but, in some cases, we have given courses of cropping, labouring, and manuring. But as this subject is likely to be much more generally understood than Landscape Gardening, as connected with Architecture, we have taken care to restrain our remarks, so as to keep them within due limits.

11. *In our Designs for Farm Buildings,* we have always taken care to state the extent of the Farm, and the kind of culture, for which they are adapted; taking chiefly, as precedents, the climate and farming of the best districts of Great Britain; but partly, also, the circumstances of France, Holland, Belgium, and Germany. The same countries have been kept in view, in arranging our Designs for Country Inns and Public Houses, and for the Workshops of Country Tradesmen and Mechanics.

12. *The Order in which we have arranged these Designs, is as follows:—*

Book I.—Designs of Cottages for Labourers, Mechanics, Country Tradesmen, and Small Farmers; of Lodges for Gardeners, Bailiffs, Land Stewards, and other Superintendants on Landed Estates.

Book II.—Designs for Farm Houses and Farmeries; Country Inns, with Farm Buildings attached; Fermes Ornées, and Villa Farms.

Book III.—Designs for Cottage Villas, and Villas of the highest class, with their accompanying Offices, and other Buildings.

BOOK I.

DESIGNS FOR LABOURERS AND MECHANICS' COTTAGES, AND FOR DWELLINGS FOR GARDENERS AND BAILIFFS, AND OTHER UPPER SERVANTS, AND FOR SMALL FARMERS AND CULTIVATORS OF THEIR OWN LAND.

13. *The Designs of this Book* are calculated for what, in countries having a privileged aristocracy, are called the lower and middling classes of society; but which, in self-governed democracies, like North America, or in newly-colonized countries, like Australia, constitute nearly the whole rural population. We have arranged these Designs in two chapters: the first contains three Designs of what may be called Model Cottages, as each combines all the accommodations and arrangements for comfort and convenience of which buildings of the lowest class are susceptible. Each of these Designs contains the same quantity of accommodation, but differently arranged to suit different situations and climates. The second chapter includes a miscellaneous assemblage of Designs, each combining more or less of the comforts and conveniencies of the Model Designs, joined to various kinds of architectural beauty and style.

CHAP. I.

Model Designs for Cottages, exhibiting in each Model all the accommodations and arrangements for comfort and convenience of which the smallest dwellings of this class are susceptible.

14. *The Accommodations and Arrangements of these Designs* are presented as the beau ideal of what we think every married couple, having children of both sexes, and living in the country, should possess; while, at the same time, we have included in them all that is essentially requisite for health, comfort, and convenience, to even the most luxurious of mankind. In such dwellings every labourer ought to live, and any nobleman might live. All that in any dwelling exceeds the accommodation and arrangements here given, must either be required for a larger family and extended hospitality, or for the display of either superfluous wealth or highly refined taste. The necessaries, and even comforts of life, are contained in a small compass, and are within the reach of a far greater portion of mankind than is generally imagined. But one room can be used at a time, by either the poor man who has no other, or the rich man who has several; and that room can only be rendered comfortable by being warm, dry, light, well ventilated, and convenient: qualities which depend not so much upon the materials used in its construction, as on the manner of applying them. All that is wanting is knowledge; first, of what is necessary and desirable; and, secondly, of the means of obtaining it at a small expense. To communicate this knowledge is the main purpose of the present Book; but more especially of the Designs contained in this chapter.

15. *In the composition of these Designs*, we have, in every case, adopted the following arrangements:—First, We have placed every dwelling-house, or the floor containing its living-rooms, upon an elevated platform, with a view of keeping it drier, and consequently, warmer and healthier; as well as to procure greater dignity of effect, as an object in landscape, and as a station for the eye to survey the surrounding scenery. Secondly, We have placed the chimnies in the interior walls, rather than in the exterior ones; because when the chimnies are so placed, a greater portion of heat is retained within the house; and because, from the greater degree of heat contained in the mass of masonry through which the flues are carried up, the smoke always ascends faster, or, in common language, the flues draw better. Thirdly, We have, in every Design, kept in view the practicability of the most economical application of fuel; of the collecting, filtering, and preserving the water which falls on the roofs; and of the collecting and economizing the liquid and other manure produced in or about the cottage. We have shown the various details for effecting these objects in plans, sections, and perspective elevations, with copious descriptions and various graphic illustrations; and we wish the Architect to keep them continually in view in judging of the Designs in Chapter II., and to imagine them applied, more or less, to each Design given in that chapter, as circumstances may admit or require. We have before published these Model Designs of Cottages in our tract entitled, *A Manual of Cottage Husbandry, Gardening, and Architecture;* but we consider the details which they exhibit as of so much importance, and all the Designs which are to follow in this work as depending so entirely upon many of

them for their chief excellencies in a useful point of view, that we have felt we should not be doing justice to our readers if we did not repeat these Designs, with their descriptions, in the present work. This we have now done in a much more clear and systematic form than was compatible with the plan of the pamphlet alluded to, and with very considerable additions both of descriptive matter and engravings.

Design I.—*A Cottage of One Story, combining all the Accommodation and Conveniencies of which human Dwellings of that description are susceptible.*

16. *In the Ground Plan of this Design*, marked I. in page 10, *a* represents the kitchen, or living room. The floor of this apartment may be of tiles; or paved; or laid in a composition of lime, sharp sand, and Roman cement; or of lime, sharp sand, and scoria from a smithy Composition floors of this kind are much warmer than those of stones or tiles. In the ceiling, nearly over the hearth, is a trap-door to the loft; which door may, in summer, be partially opened to promote ventilation, there being a false flue in the chimney for that purpose, which will hereafter be described.

b, A small parlour, with a fire-place and boarded floor: as it will receive a good deal of heat from the kitchen fire, it will seldom require a fire made on purpose for it. It ought to have a small ventilator in the ceiling, near the stack of chimneys, communicating with the false or air flue, for summer use.

c, Family bed-room; the floor of tiles, or paved, or of the same material as that of the kitchen.

d, Bed-room for girls; the floor boarded.

e, Bed-room for boys; the floor boarded. There may be a door in the partition between these small rooms, which it may be convenient in some cases to use instead of the door between the girls' bed-room and the family bed-room.

f, Water-closet for the mother, girls, and females, supplied by water as to be hereafter described. The basin may be of brown earthenware or of cast iron, so as to cost very little; the door ought to open inwards, and the small window outwards, so that every movement of the door may act as a ventilator. There might also be a water-cock and wash-hand-basin.

g, Tool-house, and man and boy's water-closet, with an opening to the loft for ventilation: supplied with water from the same source as the other water-closet. The basins of both closets communicate with an earthern pipe, which empties itself into the reservoir of the cess-pools for liquid manure. The liquid manure thus gained will be of so much value to the garden, as alone, independently of cleanliness and decency, to justify the expense of two closets, and both of these *water*-closets.

h, Cow-house, with a tying-post and trough for food in one corner, and a loft for hay and straw over: this loft may be got at through a trap-door, by the use of a common ladder.

i, House for fuel, lumber, or for various other purposes, such as roots or other food for the cow and pigs. In cases where the cottager grows corn, it may be made his barn; and if it were desired to have this barn larger, it could easily be made so, by projecting the whole lean-to two or three feet farther from the main body of the house.

k, Place for ducks or geese, with a small poultry-stair or ladder to hen-loft formed over *f* and *g*. This loft ought to be lined with straw on the top and sides, in order to keep the poultry warm in winter and cool in summer.

l, Cistern for receiving half of the water which falls on the roof.

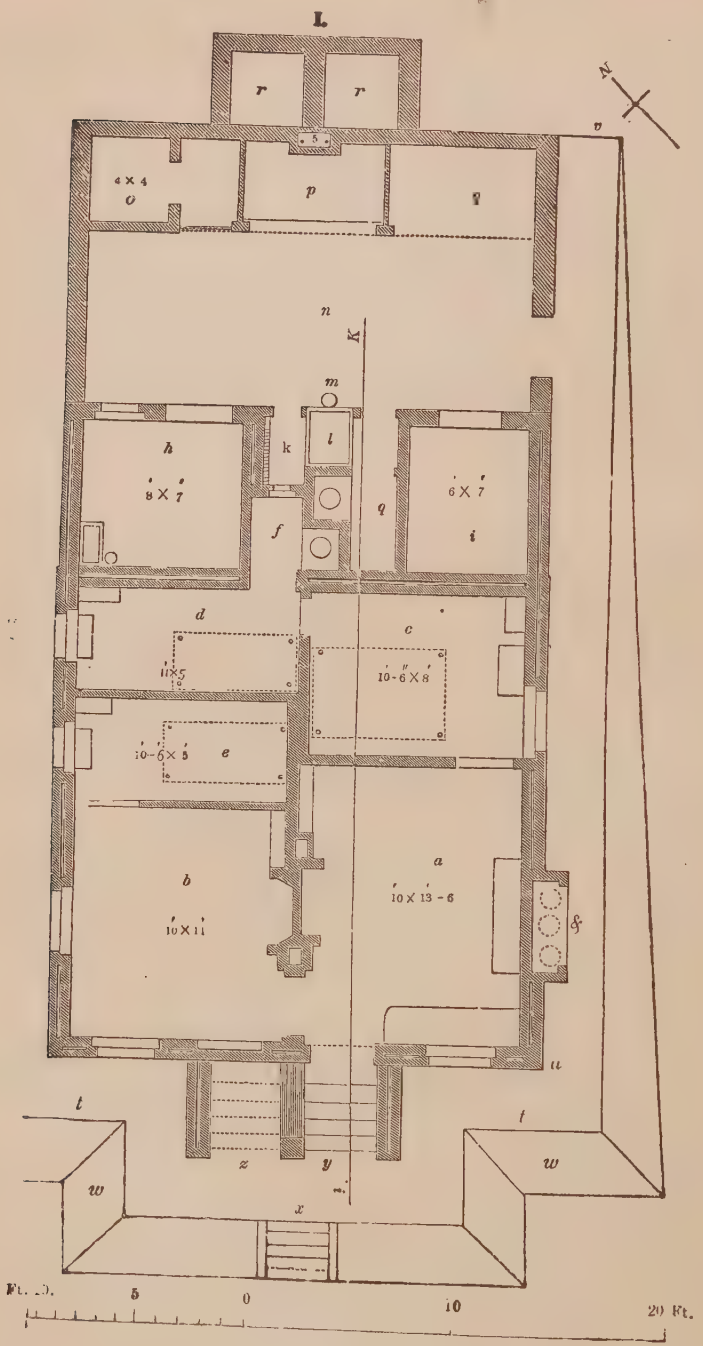
m, A pump for pumping water from the tank below, either for use in the back yard or in the house, or for raising the water into the water-closet cistern above. Siebe's rotatory pump is the best adapted for these different purposes, being at once a lifting-pump and a forcing-pump. It costs no more than a common pump, may be worked in far less room, and with greater ease, by a female or a boy, and is much less likely to go out of order.

n, The open yard, which should have a gentle inclination from all sides towards the dungpit (*p*).

o, Pigsty, with a rubbing-post in the open area or feeding-place. Two old barrels, for pigs' food, will require to be placed under cover, where they can be kept from freezing in winter, and from being extremely hot in summer. One of these ought to be filling while the other is emptying, and the contents should not be made use of before fermentation has commenced. The fuel-house, *i*, will be a very good situation for these tubs in summer, and a corner of the cow-house, *h*, in winter.

q, Shed for faggot-wood. *o*, *p*, and *q*, may be roofed with one lean-to, or pavilion roof of uniform height and width; or, if corn be grown by the cottager, then, instead of a roof of slates, tiles, &c., may be substituted a floor of joists of the same width as required for the

I.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roof; and on this floor may be laid, first, a layer of faggots, and on these built the corn or hay as a stack or stacks, and thatched in the usual manner. This would save the expense of tiles or slates, and also the ground that would otherwise be requisite as a rick-stand.

r r, Two cesspools for liquid manure, i. e. for all the drainings of the open yard after they have passed through the dung-pit, *p*, for the water of the two closets, and that proceeding from the sink to be described hereafter, including soap-suds and all waste or foul water made on the premises. As it is found advantageous that liquid manure should undergo fermentation before it is used, two cesspools become necessary, and also an arrangement by which the supplies from the different sources can be turned into either cesspool at pleasure.

s, The situation of two plug-holes, for regulating the admission of water to the cesspools. The well containing these plug-holes is, in horizontal dimensions, one foot square, and in depth, three feet. The sides are built of brick or stone, and the bottom is formed of one stone, containing the two holes, each of which is three inches in diameter; the left hand hole communicating with the left hand cesspool, and the right hand hole with the other cesspool. A plug, with a handle four or five feet long, is to be used for stopping the communication with the cesspool which is filled and undergoing fermentation: and as these pools are alternately filled and emptied, the plug can be removed from the one hole in the regulating well to the other. These pools are placed without the open yard, in the supposed garden, for the greater convenience of emptying them.

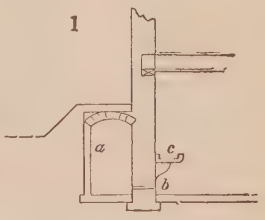
t t, The level part of the platform, or terrace, on which the house appears to stand, and which will be better understood by referring to figs. 6 and 17, or to Designs IV. and V.

u, Point at which this platform commences to incline gradually till it terminates at *v*.

w, Sloping sides of the platform; the slope being 45° in stiff loamy soils, and 30° or less, in loose soils. The platform may be covered with turf, or ornamental plants, and finished with a parapet or low hedge, as will be afterwards described.

x, Steps for ascending the platform, opposite the principal door of the cottage.

y z, Entrance porch: *y* represents the steps leading up to the living floor, and *z* the steps leading down to the cellar floor. If the front of such a porch were to any other quarter than the south-east, the porch should be larger, with an exterior door; if it fronted the south-west, the entrance to the porch ought to be on its south side, for the sake of protection from the weather.

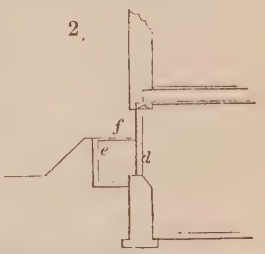


&, Shelves for bee-hives; the upper part of which may be fitted up as a dove-cote, and the lower part as a dog-kennel.

17. *The Section* A B *of fig.* 3, is represented in fig. **1.** It shows the reserve tank, *a*; the opening for inserting the cock for drawing supplies from it, *b*; and the sink, *c*.

18. *The Section* C D *of fig.* 3, is represented in fig. **2.** It shows the cellar window, *d*, with the open area before it, *e*, covered with a grating, *f*.

19. *The Plan and Section of the Cellar floor*, shewing the heating flue, and the foundations, are given in figs. 3 and 4.



a, Steps of descent to the cellar. These steps are represented in Design I. by the letter *z*.

b, Apartment serving as a back-kitchen, wash-house, brew-house, bake-house, &c., as well as for boiling or scalding food for the cow, pigs, and poultry.

c, Store cellar and larder for potatoes, beer, home-made wines, fresh and salt meat, and similar articles of provision.

d, Milk-house and pantry; in the farther corner in the ceiling ought to be a small grated opening, communicating with the air-flue in the wall, to promote ventilation; the exterior window ought to be of wire or hair cloth, which both excludes air and heat or cold.

e, Copper for brewing, washing, heating water for the bath, &c., unless a copper pot or iron box is fixed over the oven, when a separate copper becomes unnecessary.

f, Oven for baking, and also for heating the floor of the living-room and family bed-room.

g, Termination of the double covering of the flue, commencing at the oven, *f*. (See also letter *g*, in fig 4.)

h, Brick-on-edge work, for strengthening the sides of the flues.

i, Loose round stones between the flues, for the purpose of retaining heat.

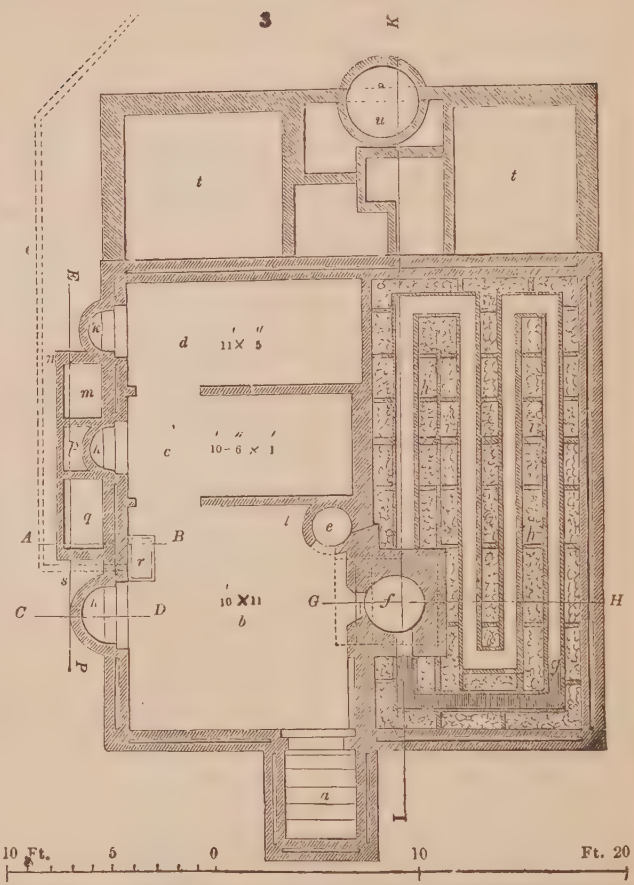
k, Sunk area, before the cellar windows.

l, A situation in which a bath may be placed, to be supplied with hot water from the boiler, *e*, or the cast-iron box over the oven, *f*, or with cold water from the reserve tank, *q*.

m, The receiving tank, which, in addition to the pipe from the roof, has another pipe from the inside, with a funnel, into which a supply may be poured for filtration, from the pump (*m*, in Design I.), in times of great drought, or at any time when the reserve tank is exhausted.

n, Waste pipe from this tank, communicating with the drain pipe.

3



o, Drain pipe, communicating with the well, with plug-holes connected with the cess-pools (*s*, in Design I).

p, Filtering tank, consisting of sand and charcoal, placed on a false bottom, raised three or four inches above the bottom of the tank.

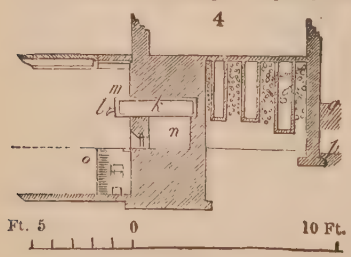
q, Reserve tank for the filtered water, communicating by a cock with the sink, *r*, and the sink having a stink-trap (see fig. 13, *d*, in p. 18,) connected with a waste pipe, *s*, which joins the drain pipe, *o*.

t, Foundations of the out-buildings, shown in Design I. by *f*, *g*, *h*, *i*, *k*, *l*, and *m*.

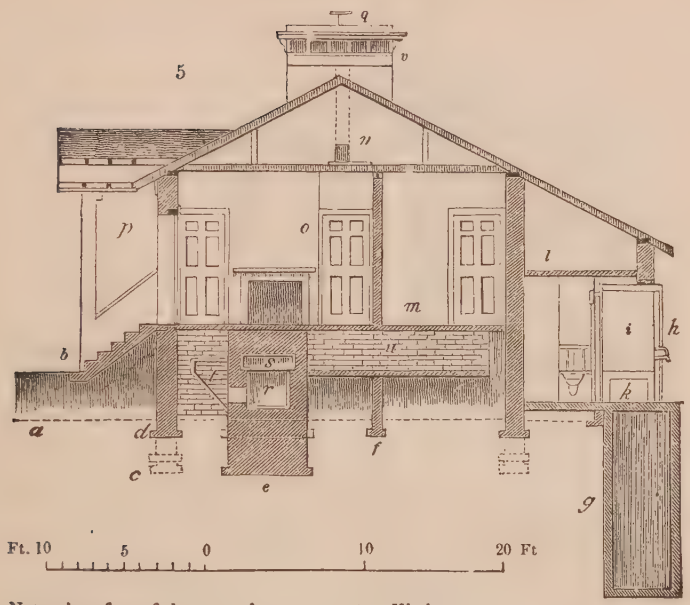
u, Tank, or well of water for general purposes, and for supplying the filtering tank in times of extraordinary drought.

20. *The Section showing the depth of the flues and the cast-iron box over the oven for heating water*, is represented in fig. 4. This section is taken in the line G H, in fig. 3, and the object is to show the depth of the flues; the double cover and vacuity between the covers at *g*; the cast-iron box of hot water, *k*; the cock for drawing water from it, and for emptying and cleaning it, *l*; the situation of the small lid for filling it, *m*; the oven, *n*; the copper, *o*; the natural surface of the ground, *p*; and the surface of the platform, or terrace, *q*.

4



21. *The Section showing the height of the rooms*, and other particulars, is given in fig. 5. This section is taken in the direction of the line I K, in Design I, and it shows the following particulars:—

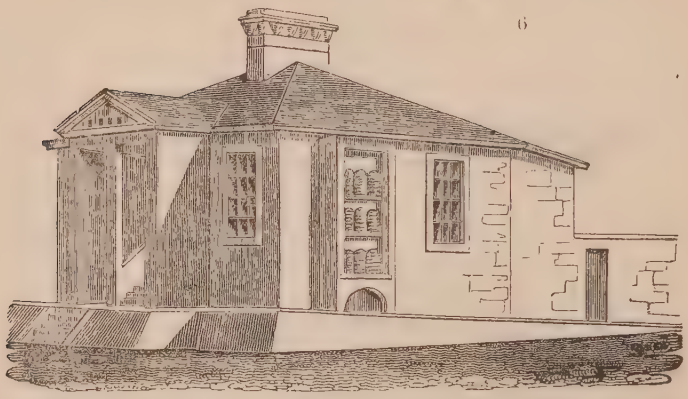


a, Natural surface of the ground.
b, Surface of the platform.
c, Level of the foundation of the cellar.
d, Foundations of the other walls.
e, Foundation of the oven.
f, Foundation of the partition wall between the living room and family bed-room.
g, Well or tank.
h, Siebe's pump, with an ascending pipe into the cistern, *i*.
i, Cistern for the water-closets, and for supplying the yard.
k, Place for ducks or geese beneath.
l, Hen-house, with tool-house and man's water-closet under.
m, Family bed-room.
n, Loft, with ventilator, or trap-door, from the kitchen, and opening near the air or ventilating flue.
o, Kitchen.
p, Porch.
q, Cover to the air flue, which is only kept open during summer to prevent excessive heat at that season: it is simply a square paving tile supported by an iron shank, in order to exclude rain.
r, Oven.
s, Water-box over.
t, Commencement of flue from oven.
u, Continuation of flue.
v, Cornice to chimney top, made large for the purpose of encouraging swallows to build their nests there; these birds being of great importance to cultivators or possessors of gardens, as destroyers of winged insects, on which they live entirely.

22. *The perspective elevation* of the entrance front and south-east side of Design I. is shown in fig. 6. The object of this elevation is to show the general appearance of this description of cottage. The steps to the level part of the platform are seen on the left, and the gradual inclination of the surface from the south corner to the south-east corner to the yard-wall. The shelves for bee-hives are shown with the dog-kennel under, but the dove-cote is placed over the entrance porch.

23. *General Form.* The most economical form in which a house can be built, is well known to be the cube. Not only does this form afford the greatest quantity of accommodation, with the least quantity of walling and roofing, but it is easier warmed; and, when warmed, it retains the heat better than any other form, more especially when the chimneys are placed in the interior walls, the reason being that a smaller extent of surface is exposed to the exterior atmosphere.

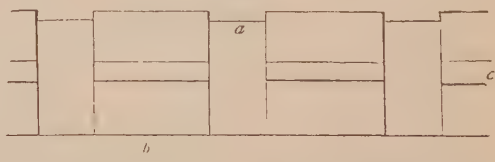
24. *Aspect.* With reference to Britain, and to the flat countries of most parts of Europe, the mildest aspect is the south-east, and, therefore, the door of a cottage should, if possible, be placed on that side. The next best side is the south; and the two worst are the north-east and the south-west. It is very desirable, in a cold moist climate, that the sun should



shine on all the exterior walls of the cottage, and also in at all the windows, every fine day in the year, for the sake of keeping the walls dry, and the interior warm and cheerful. This object may be accomplished by placing any building, which is, or can be, resolved into a square, or parallelogram, on the ground plan, so as that a north and south line will form the diagonal figure. This being done, the out-offices should be placed on the north-west side of the square, or parallelogram, as in Design I. The dairy and the pantry should always, if possible, be placed on the same side, or with a north-east aspect, for the sake of coolness. Tanks for water should also be on the same side, and under ground, for the same reason.

25. *Construction.* The walls of this cottage may be built of stone, or brick, or earth; but either of the two former are, undoubtedly, preferable to the latter, both in point of strength and durability. In situations, however, where these materials are too expensive, or cannot be obtained, every part of the walls here shown above the platform, may be formed of earth, either in the *pisé* manner, by compressed blocks, or by lumps of loam or mud mixed with straw. Each of these modes will be described hereafter. In Design I. we have shown the walls as if built of brick, eleven inches wide, with a vacuity in the centre. This we propose to be done by keeping the width of the wall at eleven inches, working the outside fair (even); and, on the inside, keeping the headers or cross bricks, fig. 7, *a*, one inch within the line of the stretching or lengthway bricks, *b*, and keeping these lengthway bricks two inches apart along the centre of the wall, *c*. Walls built in this way are much handsomer on the fair side; at least equally strong with solid walls; always dry, and less easily penetrated by the cold in winter, or the heat in summer. The inner surface, being uneven, is peculiarly favourable for receiving and retaining the plaster. Hollow cottage walls may also be built by placing the bricks, both headers and stretchers, on edge, as first practised by Mr. Silverlock, of Chichester. They may be also built with bricks halved lengthways, by cutting with a knife or wire before burning, as recommended by Mr. Dearne. (*Hints on an improved Method of Building, &c.* London, 8vo. 1821.) Both these modes will be afterwards described. The roof may be covered with tiles, slates, thatch, &c., at pleasure or convenience. Other ordinary particulars of construction and arrangement have been incidentally mentioned in describing the ground plan, § 16, and in figs. *1* to 5, § 17 to 22. Some which are less common follow.

7



26. *Platform, or Terrace.* The principal use of this part of our plan, is to keep the living floor of the cottage dry, and to prevent the necessity, in moist situations, of much excavation for the sunk apartments. Secondary advantages are, that it furnishes a neat and comfortable walk round the house, and adds to the dignity and stability of its appearance. To have the walls of so artificial and important an object as a house, rising abruptly from a plain flat surface, whether that surface be dug or covered with turf,—in short, whether it be a garden or a field, cannot be considered as either in harmony with nature or reason. Every work of art is recognised as such by the appearance which it displays of design; and the

preparatory terrace may be considered as enhancing this appearance, and raising its character Independently, therefore, of the platform being useful, its importance on the principle of enhancing the character and dignity of the design to be raised upon it, ought, in our opinion, to ensure its almost universal adoption in buildings erected in the country. The platform, in Design I, is five feet broad, and includes a border of one foot for wall-trees and flowers next the house, and a margin of one foot, which should be of turf, on the outer edge, leaving a walk between of three feet, which ought to be gravelled. The exterior sides of the platform may have different degrees of slope, according to the nature of the soil, and the culture or application of the slope. For a loamy soil, the platform may be covered with turf, with a furze or a box hedge, about two feet high, along its upper angle, and the slope may be 45°; where a loamy soil is to be cultivated as a flower border, the slope may be from 35° to 30°; a sandy soil should have a still greater slope. Where stones are abundant, the slope may be formed into rock-work, with a small hedge at top, or a dwarf wall, or a row of rough stones. In some situations, it might be worth while to form a rough trellis over the roof, about a foot above it, and on this trellis to train either apples, pears, plums, or vines, for their fruit; or, in severe climates, ivy, for the sake of retaining heat, by its evergreen leaves, in winter. On the side walls of the cottage there might be trained fruit trees, or vines, together with ever-flowering roses, honeysuckles, and a variety of climbing shrubs and flowers; but, at the same time, there is danger of indulging in these to such an extent as to keep the walls damp, and to encourage flies, and other insects, which are disagreeable in the house. The small border of one foot wide, under the wall, may always be planted with low flowers, and great might be their variety and beauty, if the taste of the occupant lay in this way; but the number and kind of shrubs and trees to be planted among these, with a view of training up the walls, must depend on the climate, aspect, and other circumstances. We shall afterwards give a list of climbing shrubs, and fruit trees, suitable for the purposes in view, in different climates.

27. *The outer margin of the platform* may either be finished with or without a low hedge, or by a low parapet, or other fence of wood or iron. If with a hedge, the sameness of the line may be broken by small standard trees, four or five feet high, at the angles; and we see no reason why these standards should not be cut (not clipped,) into shapes, as well as the hedge, if the cottager's taste inclines him to do so. The standards may either be of the same species of tree as the hedge, but in a state of variegation,—say a green box hedge, with variegated box standards,—or of a different species. Green, and variegated box, are among the best shrubs for this purpose, in point of utility; because every time the box is pruned, the twigs may be used as a substitute for hops, in brewing. But, in most cases, an architectural parapet will have a better effect than a dwarf hedge, and this may always be made an object of great beauty at very little expense. We shall afterwards show in how many different ways common bricks and tiles, and stones, rough or hewn, may be formed into these parapets. We shall also show various forms of iron and wooden parapets for the same purpose.

28. *Entrance Porch.* No edifice whatever, in our opinion, is complete, unless some distinctive mark is placed on the opening by which it is entered. What a portico is to a palace or a public building, a porch is to a cottage. A porch is not only the distinctive mark of the entrance door, but, being a protection to it from the inclemency of the weather, it must tend to preserve the warmth of the apartment within. No cottage, therefore, ought to be without its porch. In many cases, the porch may be a wooden structure superadded to the cottage; in others, a vestibule within may serve the same purpose; but, for stability, durability, and dignity of effect, the porch should always project from the main body of the edifice, and be built of the same materials, and in the same taste or style as the cottage itself.

29. *Chimney Tops.* In every human dwelling, these ought to be conspicuous objects, because they are its essential characteristics. They distinguish apartments destined for human beings from those designed for lodging cattle. They also distinguish a dwelling-house from a manufactory or workshop, by their size, form, number, and disposition. Independently of these qualities, they ought, in dwellings, to be dignified by a greater attention to design, than the less important parts of the edifice. On this subject we shall have much to say in describing succeeding Designs, but we have deemed it necessary thus early to state our guiding principle with respect to this part of the cottage, in order that it may never be supposed, for a moment, that we approve of concealing chimney tops, or of leaving them in their present mean and trivial form.

30. *Collecting and Filtering Water.* Considering it to be desirable that every cottager should be perfectly independent in respect of water, and also that rain-water is the purest of all water, we propose to show the manner in which all the water which falls on any dwelling may be collected; how to filter and preserve one part of it, in a tank, for cookery purposes

and to preserve the other part unfiltered, in a cistern and in a large tank, for the purposes of the water-closets, for the use of the cow and pigs, for washing and cleaning, and for the garden. It is calculated by Waistell, that the average quantity of water which falls on a square yard of surface in Britain, in a year, is 126 gallons; which, for this building, containing upwards of 100 square yards of roof, will give 12,600 gallons; an ample quantity for the purposes mentioned. A cottage constructed on this principle, therefore, may be set down in any situation, without reference to a natural supply of water. The cistern, *l*, in Design I, may be of cast-iron; or of slabs grooved into each other, and made water-tight with Roman cement; or of plates of Welsh slate; or of large flat paving tiles set in cement; or it may be made of wood, plastered inside with cement; or of bricks set in cement, and plastered within with the same material; or in countries where timber is abundant, as in America, or Australia, it may be formed of thick planks, well pitched; or it may be simply an old liquor cask. However constructed, it must have a waste-pipe; which, when the cistern is full, will flow over into the tank or well below, shown in fig. 5. This well or tank is to be considered as the grand reservoir of the premises; and if there should be a natural spring in it, so much the better. Should the culinary, or filtering tank, fig. 8, *f*, fail at any time, water may be drawn from this tank, and introduced into the filtering tank.

31. *The mode of filtering* is very simple, and will be easily understood from the section E F, of Design I. In this section, fig. 8, *a*, represents a vacant space of three inches from the bottom to *b*; *b*, is a slate, stone, or board, pierced with numerous holes, say at the rate of three to an inch, of about the eighth of an inch in diameter; *c*, is a mixture of clean coarse sand and powdered charcoal, or coarse burnt clay, without either sand or charcoal; *d*, a filtering stone; or in default of a stone of this porous nature, a plate of lead thickly pierced with holes, of one twentieth of an inch in diameter; *e*, an opening by which the water of the receiving tank, *f*, communicates with *a*, at the bottom of the filtering tank; *g*, an opening by which the water after it has ascended through the filter, runs over into the reserve tank, *h*. The filtering of the water may be effected in a more simple manner, by placing a layer, about six inches thick, of round stones, about the size of eggs, in the bottom of the filtering tank, and over this either burnt clay, or sand and charcoal, covered by a pierced leaden plate, as before; or by a stratum of sponge, which may be substituted for the plate. It must be evident by inspecting the section (fig. 8), that when the water supplied from the roof to the receiving tank, *f*, rises above the level of *d*, it will run over, by *g*, into the reserve tank, *h*; and that the water in all the three tanks will always stand at the same level, provided the water in the tank, *f*, be above the level of *d*.

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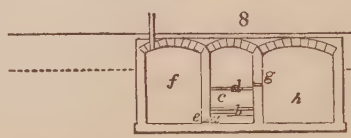

32. *The filtering material may be cleaned* by having a large cock in the bottom of the receiving tank, communicating with the waste drain; by opening which, when the reserve cistern is full, the water in that cistern will rush through the filter in a contrary direction to what it did before; and will carry off all the impurities, either in the filter, or in the space at the bottom, *a*. The filtering might also be effected by placing the filter in the tank *f*, instead of in the centre tank; and by introducing the water from the roof, direct to the space, *a*, by a pipe, through the filter; the water would then rise through the filter, and fill the tanks, *e* and *h*. A larger reserve of filtered water would thus be obtained; but the filter would require cleaning oftener. The great advantage of the mode we have recommended is, that the water will deposit the greater part of its impurities in the bottom of the tank, *f*.

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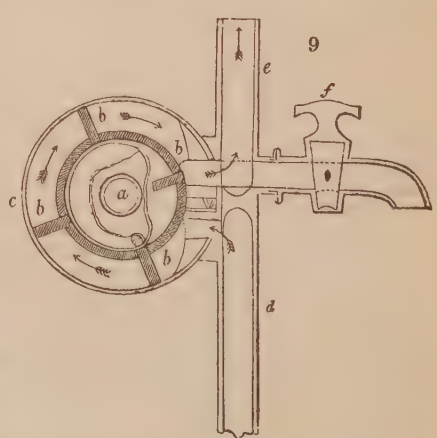

33. *For pumping up the water* from the main tank or well, *g*, in fig. 5, we have recommended Siebe's rotatory pump. This pump, fig. 9, operates by the rotation of a roller, on its axis, *a*, having paddles or pistons, *b*, *b*, *b*, *b*, by which, when the roller is turned, a vacuum is produced within the barrel, *c*. In consequence of this vacuum the water flows up the rising trunk, *d*, into the barrel, and as the paddles go round they force it into an opening which conducts it wherever it may be wanted, and by that means produces a continual stream. By having an ascending tube, *e*, this water may be forced to any height, and, by having a horizontal tube with a cock, *f*, it may be let out at pleasure, as in a common pump. By having several pipes branching from *e* as many cisterns or reservoirs might be supplied. The appearance of this pump is very neat and simple, fig. 10; but, as in the case of other pumps, the tubes must be covered with straw or matting, during frosty weather, otherwise the freezing of the water will make them burst.

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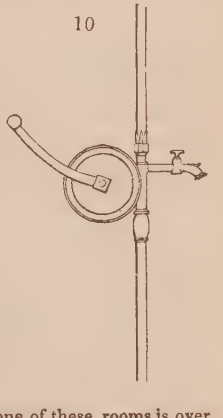

34. *The mode of heating by a flue below the kitchen floor* we consider a most valuable plan for ensuring and economizing heat, particularly in cold countries, where fuel is scarce. Indeed, we shall afterwards show how, with this arrangement, and an extra quantity of land, say an acre, besides garden ground, every cottager may grow all his own fuel. Whenever there is a back kitchen adjoining the principal kitchen, or cottager's living room, and both are on the ground floor, this mode of heating the floor by a flue may be adopted. All that is necessary is to have a sunk area in the back kitchen for the oven, as will be shown in Design IV. When there are two rooms on the ground floor, and one of these rooms is over a cellar, as in Design I., then the oven or furnace can be made in the cellar. In either case the courses of the flue are to be so contrived, as to allow the covers, supposing them to be one-foot tiles, to form the floor of the two rooms which it heats. The flues may be of any convenient depth exceeding eighteen inches, their sides built of brick-on-edge not plastered, and the intervals between the flues filled up with loose stones or rough gravel. If the flues are made deep, which in some cases may be found cheaper than preparing a raised solid basis on which to build shallow flues, then the side walls may be tied together by brick-on-edge work, (Design I., *h*,) and the foundation of the partition wall, which separates the family bed-room from the kitchen, will contribute to the same end. To equalize the heat given out by the flue, and to prevent the kitchen floor from being too hot where the flue proceeds from the oven, a double covering is there shown, with a vacuity of six inches between the under cover and the floor, from the oven, *f*, to *g*; a section of which may be seen in fig. 4, at *g*.—As faggots are intended to be burnt in the oven, the soot produced will be very trifling; but the flues may be cleaned once a year by taking up a tile at each end of the different courses of the flue. Except when there is a fire in the oven, its door must be kept perfectly close, and a damper in the upright flue, nearly so. In many cases, instead of a flue, a vault may be made under the kitchen, and the smoke from the oven or furnace allowed to spend the principal part of its heat in this vault, and afterwards ascend a flue proceeding from near its bottom, fig. 11, *a*. As the walls, from the superincumbent weight, would form abutments of very great stability, the arch might be made very flat, and would thus cost less in execution than the flues.

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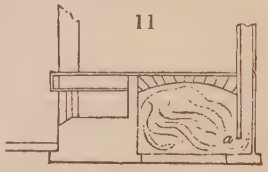

35. *The immense superiority of this mode of heating* the air of a room, over any other whatever, will be obvious to every one acquainted with the nature of heat. By open fire-places, by stoves, steam-pipes, or water-pipes, (unless indeed these are in the floor,) and, by heated air, the coldest stratum of air is always found immediately on the floor, where, for the sake of the feet and the legs, the air ought to be hottest; by the method of under-ground flues, or a smoke vault, as in fig. 11, the lowest stratum is necessarily the hottest, which must be preferable for the feet and legs of grown persons, and for the whole bodies of little children. The heat being diffused over the whole surface of the floor, must contribute greatly to the equality of the temperature throughout the apartment, and the mass of loose stones, or the materials of the arch will continue to give out heat for a day or two, according to the season of the year, after every time that the oven is heated. The heat from the floor, in its ascent to the roof, will warm whatever it meets with; but this is not the case with either raised stoves or open fires. In heating

by open fires or common stoves, the heat ascends directly to the ceiling, and is there in a great measure wasted, as far as it respects the persons in the apartment; but by this mode the ceiling will not in general be hotter than the floor.

36. *Hot water for domestic purposes* may always be obtained by a very simple arrangement connected with the oven and flues. Over the oven, and as a cover to it, instead of brick-work, might be placed, or built in, a cast-iron box or iron pot for heating water, as shown by the dotted lines in the plan fig. 3, and by *k*, in fig. 4. The upper surface of this box or pot might form a part of the kitchen floor, as at *e*, in fig. 22; and might have a properly secured flat lid on that side, to admit of putting in and taking out water; or the box might be entirely buried in masonry, as in fig. 4, and in that case a part of it should project from the wall into the back kitchen, or cellar, and should have a lid to open, for the purpose of filling and cleaning out, and a cock, *l*, in fig. 4, for the purpose of drawing off the water. If this box were two feet, or two and a half feet square, and nine inches or ten inches deep, it would supersede the necessity of the copper, fig. 3, *e*, and in summer, when the heat of the flue was not wanted, a damper withdrawn would admit the smoke to ascend directly through a flue to the chimney top. A family with a pot or box of this kind over their oven, the box or pot either opening only from the kitchen above, or both from above and from the back kitchen, would, throughout the year, scarcely require any other fire than what was made in the oven; all their roasting and baking would be done in the oven, and all their boiling in the pot or box over it. As it might not be always convenient or desirable to boil the large box or pot full of water, there might be a well of six inches diameter, and nine inches deep, cast in its bottom, and the small quantity of water which this well would contain would be boiled with very little fuel; for tea, or any similar purpose, a tin jug of water might be set in among the water in the well, which would keep the former perfectly pure. A very small quantity of fuel consumed in such an oven will have a powerful effect in heating the water above it, from the difficulty of the heat escaping by the sides. By this mode of heating and cooking a smaller quantity of fuel may be made to suffice for the wants of a family than by any other method that we are aware of; since no more can escape by the chimney than is absolutely necessary to carry up the soot. Water might easily be drawn out of the well, or out of the box or pot when in common use, from the upper kitchen, without stooping, by inserting a long tube, like a trumpet, fig. 12, made of tin, and open at both ends. When plunged in the water, if the thumb be placed on the upper orifice, *a*, and retained there, the water in the lower part, *b*, may be transferred to any other vessel.

12

37. *Water-closets and tanks for liquid manure.* A water-closet or privy ought to be attached to every human dwelling, and in all cold countries it should form part of the edifice, and be approachable under cover. No cottage is, therefore, in our eyes, complete without this appendage under the same roof, or under a lean-to. The well or tanks for liquid manure connected with it, are as advantageous, in point of profit, to every cottager who has a garden, as the water-closet or privy itself is essential to cleanliness and decency.

38. *The Water-closets* may be variously arranged; but as one of the best and cheapest modes, and as one the least likely to go out of order, we give the following. The cistern, fig. 13, *a*, may be at any distance from the seat, *b*, provided it be on a higher level, by four or five feet. The basin, *c*, may be an inverted hollow cone, truncated, and joined to a piece of cylindrical tube, inserted in a closed leaden vessel, technically called a stink-trap, *d*. In the side of *c*, at *e*, is a hole, or vertical slit, passing obliquely through the sides of the basin, and communicating with the cistern, *a*, by the pipe, *f*. The water in the cistern is prevented from running off through this pipe, by the valve, *g*, shown in fig. 14, on a larger scale. When it is desired to allow the water to rush down into the basin, it is only necessary to pull the string, *h*; which, if the cistern be at a distance, may pass over several pullies, according to the number of angles in its course. In order to ensure the descent of a quantity of water to the basin every time it has been used, a cord, *i*, may be joined to

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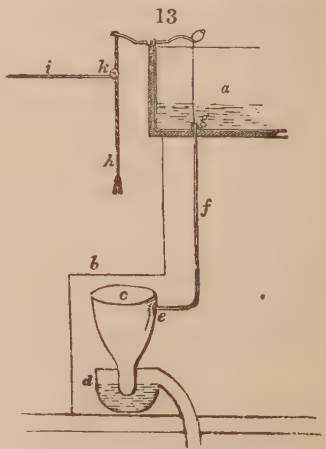

k, and passed over a pulley at *k*, and the end of this cord may be fixed to the upper part of the door of the water-closet, at such a distance from the hinge, say a foot, as will suffice to lift up the valve, *g*; or the same purpose might be effected by a lever, fig. 15, *l*, which would be acted on every time the door was opened.

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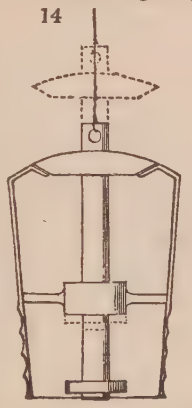

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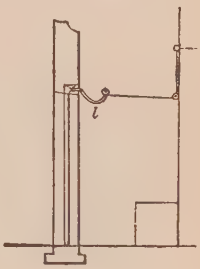

39. *When the cistern is unavoidably placed on a level with the basin*, the opening for the admission of water must be much larger than in the first case. This opening may be closed by a valve, similar to that marked *g*, in fig. 13; but a better mode is to have a lever valve, fig. 16, *m*, which will also be operated upon by the door every time that it is either opened or shut. In every case in which it is intended that a common or lever valve should be operated on by a door, the latter ought to have a spring bolt (a contrivance for shutting the door, which will be afterwards figured and described), to shut it, lest at any time it should be left open by neglect. There are different methods of constructing a privy to be used without water. One is, to have a basin, as in a water-closet; and to continue down from it, a tube so far into the cesspool below, as to prevent the rising through it of air, and consequently of smell. If all the waste water of the house is, as it ought to be, poured into the basin, neither that nor the tube will ever be choked up; and, in that case, this construction may be considered one of the best for preventing smell. The next mode is to have no basin; but to take care that the surface of the cesspool exposed to the air, is no larger than is necessary; and that no crevices are left in the seat, so as to admit of a current of air passing over the surface of the cesspool. There ought, both in this case and in the other, to be two covers to the hole in the seat; one of a circular form, to fit into the opening, and the other, larger and square, to be affixed by hinges to the back board, so as to shut down over the whole seat. The windows in all water-closets ought to be close to the ceiling; both to prevent the persons within from being seen, and to admit of a more effectual ventilation.

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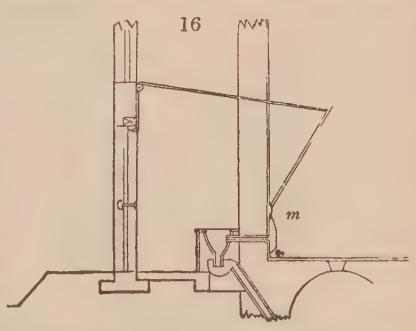

40. *General Estimate.* What is called a general estimate of the expense of a building is calculated at a certain rate per cubic foot, while a specific estimate is made up of the separate estimates of each particular article. The rate or price at which a general estimate is calculated, depends upon a variety of circumstances; but in every situation, the principal points by which it is affected (all others being the same) are,—first, the irregularity of the outline of the ground plan, and of the elevation; secondly, the number of angles in the roof, or the number of separate roofs; and thirdly, the ornamental or carved work, both within and without the building. The nearer the whole mass of a building approximates to the form of a cube, and the nearer all its separate parts approach to that form, the lower will be the rate per foot. One roof of the simplest form may always be calculated at a lower price than a varied roof, or several roofs. In Britain, buildings are divided into three classes: called, first, second, and third-rate buildings. Cottages, and such dwellings as are contained in this Book, belong to the third-rate class, and are generally calculated at from four-pence to six-pence a foot for London. From the amount thus obtained, fifteen or twenty per cent. is generally deducted, and the total thus found is the amount of the general estimate.

41. *The cubic contents of this building* are 16,833 feet; and the following is the manner in which these contents are calculated:—

Length of the front of the main building ..... 24 feet.
Width of the main building ..... 23 feet.
Height from the bottom of the foundations to the middle of the roof 23 feet.
Then, for the contents of the main building..... $24 \times 23 \times 23 = 12{,}696$ feet.
Length of the lean-to building ..... 23 feet.
Width of the lean-to..... 9 feet.
Height, including cistern, pump, and well .. 16 feet.
Then, for the contents of the lean-to..... $23 \times 9 \times 16 = 3{,}312$ feet.
Length of tanks..... 10 feet.
Width ..... 5 feet.
Height ..... 5 feet.
Then, for the contents of the tanks, and yard walls .... $10 \times 5 \times 5 = 250$ feet.
Length of sheds and piggery ..... 23 feet.
Width of sheds, &c. ..... 5 feet.
Say five feet high, as the sheds have no fronts and include the yard wall..... 5 feet.
Then, for the contents of the sheds, &c. ..... $23 \times 5 \times 5 = 575$ feet.

Whole amount .... 16,833 feet.

16,833 cubic feet, at 6*d.*, £420 : 16*s* : 6*d.*; at 5*d.*, £350 : 13*s* : 9*d.*; at 4*d.*, £280 : 11*s.* and at 3*d.*, £210 : 8*s* : 3*d.*

17

42. *Expression.* This dwelling has no pretensions to any particular style of Architecture, but it is obviously expressive of the subject or purpose in view; and, as all its details are well adapted for their various uses, whether as respects the convenience of the occupant of the cottage, or as component parts of the structure, it is also expressive of fitness. This Design may be ornamented by the addition of pillars to the porch, by a vase over it, by ornamental chimneys, and by a parapet on the terrace, fig. 17; or, if an architectural parapet is considered too expensive, a low hedge, fig. 18, may be substituted.

18

Design II.—*A Cottage of One Story, combining the Accommodations and Conveniences of Design I. differently arranged, and with the addition of a Veranda.*

43. *Accommodation and Construction.* This Design contains the same number of rooms, and of the same dimensions, as Design I. The communication with the cellar, by means

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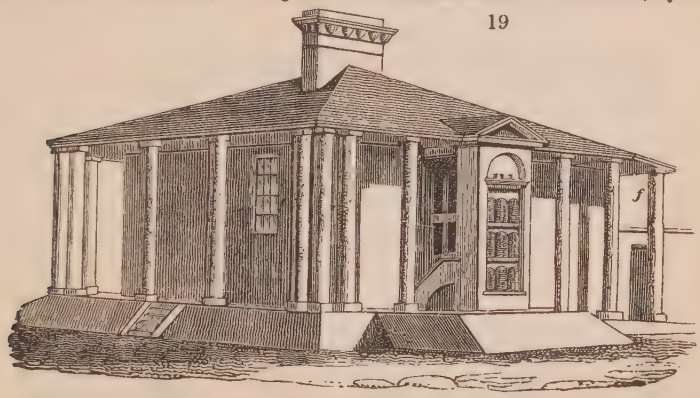

of the stair, *a*, in the lean-to, and the direct entrance to the yard, *b*, is, however, more convenient. The size of the cow-house, *c*, though somewhat diminished, is still large enough for a small cow; the space, *d*, for ducks or geese, and for a ladder to the hen-house, is not quite so commodious as in the other plan; but, on the whole, notwithstanding these drawbacks, this plan exhibits what we think a better arrangement than the preceding one. Exteriorly the platform is level as far as the steps to the porch, *e*, and thence it forms an inclined plane to the natural surface. The veranda, *f* (see fig. 19), which is supported by trunks of larch or spruce fir trees, with the bark on, set on plinths of stone, or brick, will add much to the comfort and economical uses of this residence.

44. *Aspect.* The difference in the aspect of this cottage will be ascertained by observing the points of the compass marked in the ground plan; the north and south line being in the direction of from left to right; whereas, in Design I. it is from right to left.

45. *General Estimate.* Cubic contents 17,440 feet, at 6*d.* a foot, £436; at 4*d.*, £290 : 13*s*:4*d.*; and at 3*d.*, £218.

46. *Expression.* Though no marked features of any style appear in this elevation, yet it must be acknowledged to exhibit something more than the mere expression of purpose; because it would be equally, and to all appearance, as much a human dwelling, without the columns as with them. It may, therefore, be said to exhibit the expression of improved design. This expression would be further heightened by ornamental chimney pots, and a light iron parapet to the terrace, fig. 20.

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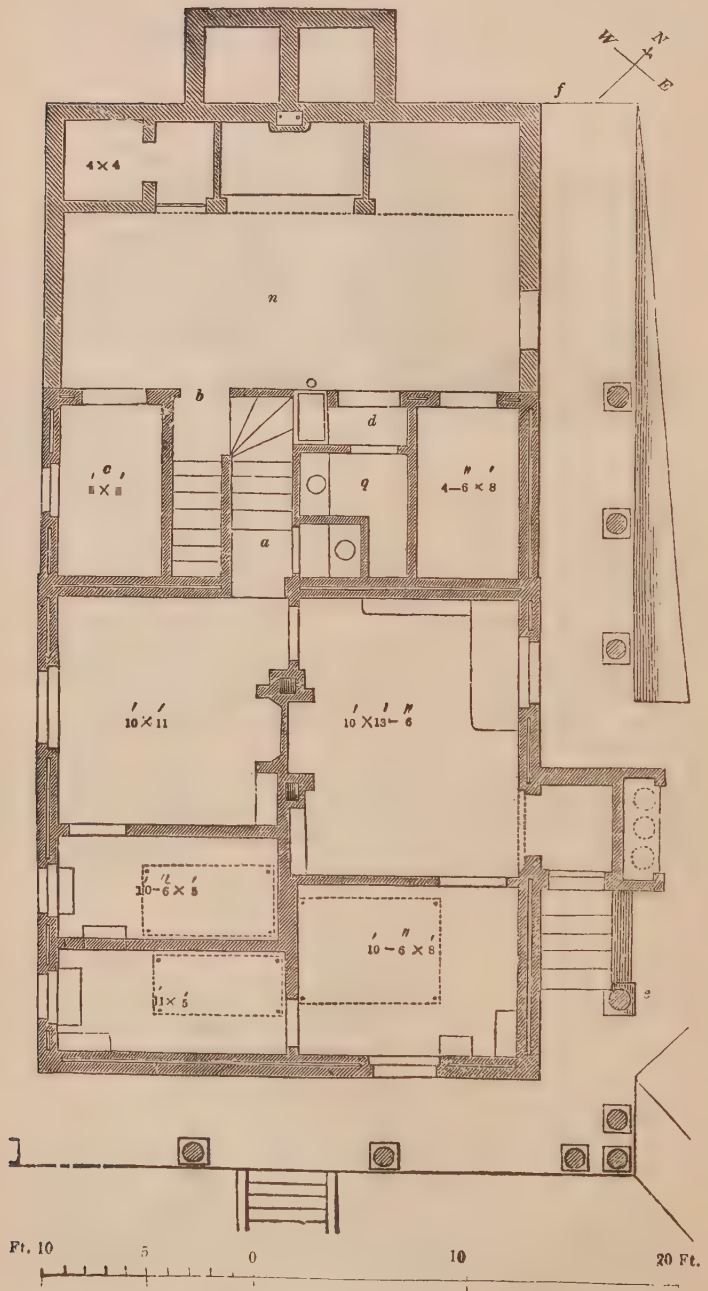
II.

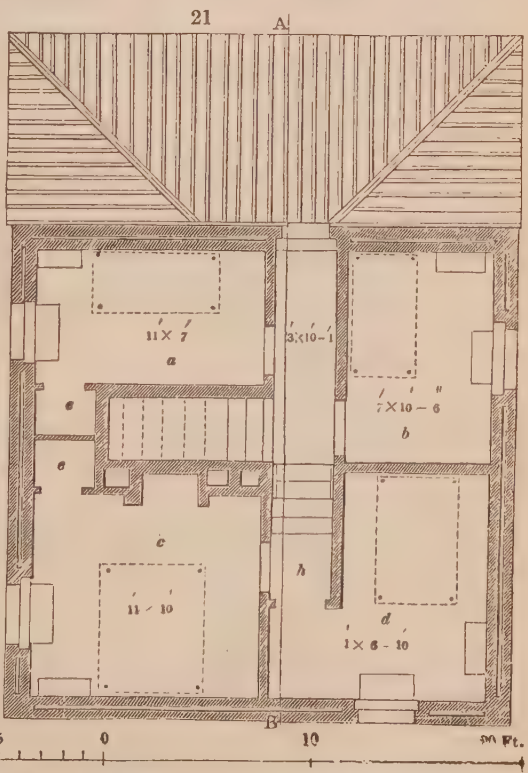


Design III.—*A Cottage of Two Stories, combining the Accommodations and Conveniences of Design I. differently arranged, and with an additional Bed-room.*

47. *Accommodation.* The same general accommodations are here given as in Designs I. and II.; but there is a second story, and this contains four bed-rooms. There is no cellar-floor, but there is a back kitchen, the floor of which is a few steps lower than that of the principal one. Into this sunk kitchen the oven opens, from which the flues proceed which heat the best kitchen and the parlour; unless it be considered desirable to have a boarded floor in the latter apartment; in which case, the courses of the flue will be confined to the floor of the kitchen. The following are the details of the ground plan, as exhibited in Design III.:—

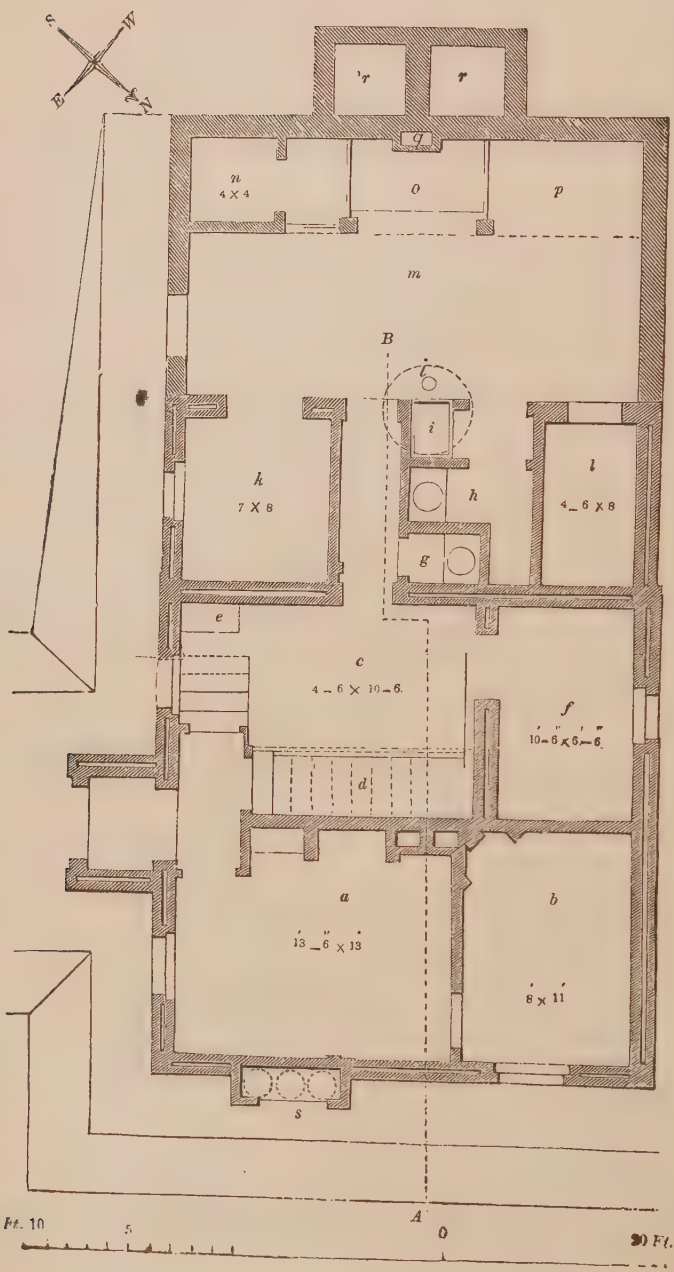
a, Kitchen.
b, Parlour.
c, Back kitchen, the descent to which is by five steps.
d, Bed-room staircase, under which are the oven and boiler; the former with its flue under the kitchen and parlour floors, which are both paved with tiles or stone.
e, Sink, supplied as in Design I. from a filtering-tank.
f, Dairy and pantry.
g, Women's water-closet.
h, Tool-house and men's water-closet.
i, Cistern for water-closets, with tank or well under, place for ducks and geese, and ladder to poultry-house at one side.
k, Cow-house.
l, Place for wood, or other fuel.
m, Open yard.
n, Pigsty.
o, Dung-pit.
p, Faggot-shed.
q, Well, for the regulating plugs to the manure tanks, or cesspools.
r r, Cesspools.
s, Shelves for bee-hives, with dove-cote over, and dog-kennel under.

48. *The Bed-room Floor* is exhibited in detail in fig. 21. In this figure, the bed-rooms, *a* and *b*, over the back kitchen and dairy, are on a lower level than the bed-rooms, *c* and *d*, over the kitchen and parlour. The positions of the different beds, chests of drawers, and dressing-tables, in the different rooms, are indicated by outlines, as in Designs I. and II.; and the vacuity in the exterior wall is shown as in the ground plan. The vertical profile of the lean-to, containing the cow-house, water-closets, and wood-house, is also shown. By vertical profile, is to be understood a view, looking down vertically upon any object. The walls and ceilings of the bed-rooms are supposed to be finished with two coats of plaster, without cornices, but with the usual fittings and finishings of joiner's work, as given in detail in the specification of Design VII. The bricks used in the exterior surface of the outer walls, should not be of a harsh red colour.



49. *The Levels of the different Floors* are shown by fig. 22, which is a section on the lines A B, in Design III., and in fig. 21. In this section may be seen the level of the open yard,

III.


E
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7 X 8
h
l
4 – 6 X 8
g
e
c
4 – 6 X 10 – 6.
f
10 – 6 X 6 – 6.
d
a
13 – 6 X 13
b
8 X 11
s
A
Ft. 10
5
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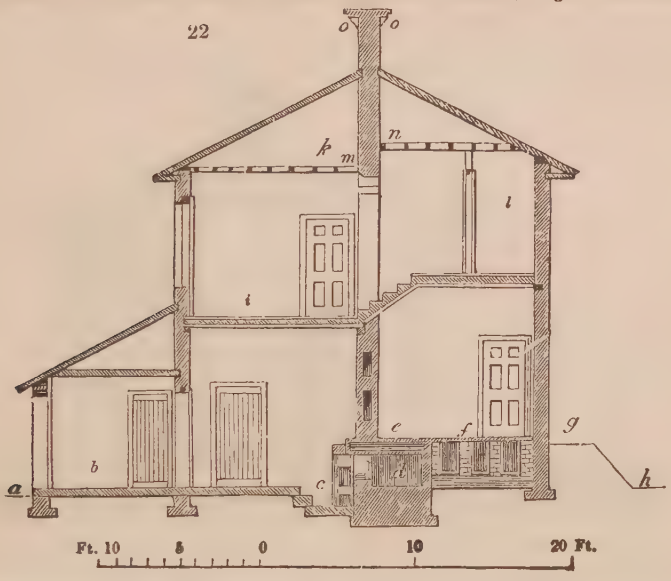
20 Ft.

a; passage from the back kitchen, *b*; sunk area under the stair, to give head-room for

22



attending the oven, *c*; oven, *d*; water-box over it on a level with the kitchen floor, *e*; flues for heating the kitchen, *f*; platform, *g*; natural surface, *h*; lower bed-room, *i*; larger loft over, *k*; closet, *l*; situation of openings to the false flue for ventilation, *m n*; cornice for swallows, *o o*.

50. *Construction.* The walls are shown as of brick, and of the same thickness as in Designs I. and II. The floors of the kitchen and parlour are formed in the same manner as those in Design I., with flues for heating. The roof may be either covered with Italian tiles, fig. 23, or with Grecian tiles, fig. 24. In putting on either of these tiles, the broad tiles, *a*, are laid side by side, and the semi-cylindrical tiles, *b*, are bedded in mortar, or in cement, over the joints. The advantages of these tiles are, that they admit of a roof being made so flat, that it may be walked on, and used as a terrace; while, at the same time, it is perfectly water-tight, and of great durability, novelty, and characteristic beauty. In Staffordshire, these tiles are made from a stratum of clay, containing a large proportion of iron; and when this clay is burnt, the tiles, or other articles formed from it, are almost as hard and heavy as cast-iron. The articles made from this clay are called terro-metallic.

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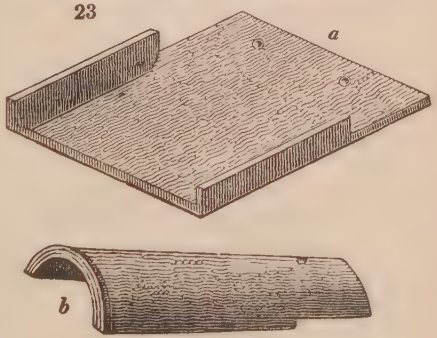

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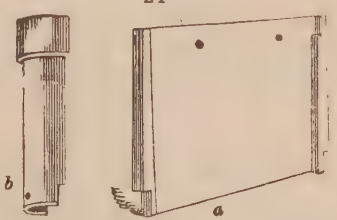

51. *Situation and Aspect.* This Design, from having the sleeping-rooms on the second story, is more particularly calculated for low, moist, shady or confined situations; in which, however, cottages should never be built if it can be avoided. By observing the position of the points of the compass in the ground plan (Design III.), it will be seen that the entrance porch is on the south-east; and that the shelves for bee-hives front the north-east.

52. *General Estimate.* Cubic contents, 19,040 feet, at 6*d.* per foot, £476; at 4*d.*, £317 : 16*s* : 8*d*; and at 3*d.*, £238.

53. *Expression.* The tiles and the cornice of the chimney stack, give the elevation of this Design, fig. 25, something of an Italian air; and therefore, in addition to the expression

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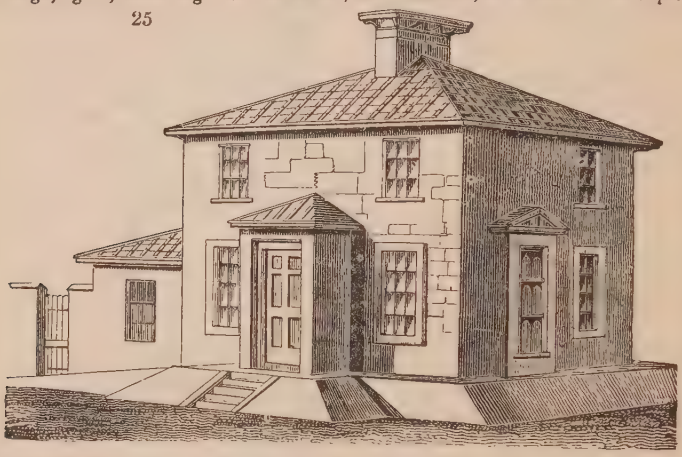


of purpose, this cottage may be said to have something of the expression of architectural style. The beauty of such a dwelling would be greatly heightened by the addition of a terrace parapet, and by ornamental chimney tops, fig. 26; and quite a different character

26

might be given to it, by having the roofing a good deal flatter, and adding cantilevers (pieces of wood framed into the side of a house, to support such mouldings as may be placed over them,) under the far projecting eaves, so as to form an Italian cornice.

Chap. II.

A Miscellaneous Collection of Designs for Cottage Dwellings, with Critical and Analytical Remarks.

54. *The Designs which follow* exhibit various modifications of all, or of several of the comforts and conveniences contained in each of the Model Designs, joined to various degrees

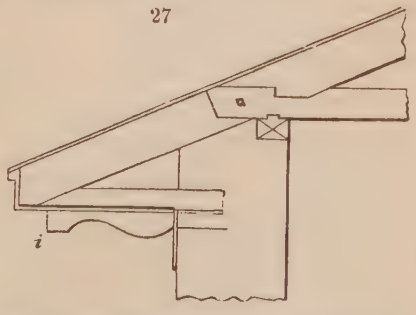
of architectural style. The object is to show how some of the improvements in the Model Designs, may be applied to even the smallest dwellings; and, how with all, or with any of these ameliorations, or without them, various degrees of architectural style or beauty may be produced in cottages. For the attainment of these objects, we have accompanied each Design by such remarks, as we think calculated to enable the reader to form an opinion of his own; grounded on sound principles, as to what is, and what is not, beauty in Cottage Architecture. These Designs might have been arranged according to the degrees of accommodation, or their scale in respect to architectural style; but considering that the first appearance of this work will be in periodical portions, we have preferred giving a miscellaneous selection in each portion.

Design IV.—*A Dwelling for a Man and his Wife, without Children.*

55. *Accommodation.* This dwelling, we consider as exhibiting the minimum of accommodation, which ought to exist for a man and his wife without children, even in a country where there is an unequal distribution of civil rights. It contains one room, *a*, in which the cooking and ordinary avocations of the family are carried on, and which serves at the same time as a sleeping-room; a wash-house, *b*, which must also serve as a store-room, pantry, and for various other purposes; a porch, *c*, for wood or other fuel, and for tools of husbandry and out-door work; a privy, *d*, and an enclosed yard, with a dung-pit, *e*, forming a circular basin, and having a well in the centre for liquid manure from the privy.

56. *Description.* The house is placed on an artificial platform, which is ascended by four stone steps, seen on the plan, near the entrance door. The surface of the platform, which may be laid with gravel, or paved, forms a walk, on three sides of the house, leading from the door of the house, to the door of the court-yard. The greater part of this court-yard is on a lower level than the platform; the descent to this level being by an inclined plane from *f* to *g*. The pit, under the seat of the privy, communicates with the well, *e*, four or five feet deep, by an under-ground drain, which may either be formed in the usual manner, by bricks or stones, or by earthenware pipes; so that whenever the well is emptied for the purpose of taking out the manure, (formed by what is thrown in from above, and what is communicated below by the drain from the cesspool, under the privy-seat,) the privy will be emptied also. In consequence of this arrangement, the seat will never require to be removed for the purpose of emptying the cesspool; and the opening in the seat may communicate with the cesspool by means of a tube, either of boards, or earthenware, which, with double covers, will prevent the rising of smell. In the section of this cottage (p. 29), it will be seen that the floor is laid on loose stones; if it be desirable to heat this mass of stones with a view to the economy of fuel, horizontal flues can be built among them, communicating with an oven, in the wash-house, at one end near the boiler, and with an additional flue in the chimney stack at the other, in the manner shown in describing the model cottages. To every dwelling there must be some source for supplying water for the purposes of food and cleanliness. The common resource is a well, from which the water is drawn either by a windlass, or lever and bucket, or a pump; but the water which falls on the roof may be applied to domestic purposes, as described in the preceding chapter.

57. *Construction.* The walls of this cottage are here shown eighteen inches thick, with a view to their being built of rubble stone (stones rough from the quarry); of *pisé* (to be described hereafter); of mud blocks (which is nearly the same thing as building in *pisé*); or of compressed blocks of common earth (also described hereafter). The footings, or lowest parts of the foundations of the walls are shown, in this Design, and most of those which follow, as only a few inches below the surface of the ground, *h*; partly because the footings being covered and surrounded by the platform, are not likely to be afterwards disturbed; and partly because very little depth of foundation is wanted for buildings, generally of one, and seldom of more than two stories high. The roof may be covered with flag-stones, or slates, or Grecian tiles; the eaves being supported by wooden blocks, or cantilevers, as shown more clearly for the purposes of the



carpenter, by the section of a portion of the wall and roof, drawn to a scale of half an inch to a foot, fig. 27, *i*. The wall of the court-yard in countries where flag-stones abound may be formed of a continuous line of these stones fixed in the earth, edge to edge; or it may be constructed of boards, or pales; or built of wood, *pisé*, or blocks of compressed earth. If formed of earth, the wall ought to have a coping either of stone or boards. The raised platform may be made of the earth dug from the dung-pit and well, or from any other convenient source, taking care not to employ any earth for this purpose, rich enough to be used for the garden, if it can possibly be avoided; the entrance door may be formed of what carpenters call bead and batten (bead, a circular moulding, stuck on the edge of a batten, i. e. a scantling or piece of wooden stuff, from two to four inches broad, and one inch thick), with cross back bars inside.

58. *General Estimate.* The cubic contents of this building are 4,000 feet, and the following is the manner in which these contents are calculated:

Length of the front of the main building, 14 feet 4 inches.
Width of the main building, 14 feet 4 inches.
Height from the bottom of the foundations of the main building to the middle of the roof, 14 feet.

	Feet	In.	Lines
Then for the contents of the main building ..... 14:4×14:4×14=	2,876	2	8
Length of the front of both wings, 8 feet.			
Width of both wings, 11 feet.			
Height of both wings, 10 feet.			
Then for the contents of both wings .....8×11×10=	880		
	3,756	2	0
Add for the wall round the court yard, and to make an even sum	243	9	4
	4,000	0	0

4,000 feet at 6*d.*, is £100; at 4*d.*, £66 : 13*s* : 4*d*; and at 3*d.*, £50.

59. *Garden.* The dung-pit and well show that this cottage is intended to have a garden, which ought, if possible, to be around it; but as dwellings like this in Britain are often placed as lodges to entrance gates, and stand on the margin of a plantation or shrubbery, the garden in that case should be on the side of the house which has windows; because that side only in such dwellings is generally left open to the air and light. High trees or shrubs near a house, if on a side which may happen to have no windows, do comparatively little injury in the way of obstructing the ventilation and lighting of the house, to what they do on the windowed side. It is a common practice in Britain to place the kitchen gardens of lodges of this sort in the interior of the plantation or shrubbery, so that they may be concealed from the road; and to have only a flower garden on the front or open side of the house; but in this case the kitchen garden is of very little use to the occupant; the surface being overshadowed by the trees, and the soil exhausted by their roots. Whatever is decidedly contrary to utility and convenience, must be in bad taste, though it may seem to a superficial observer to be otherwise.

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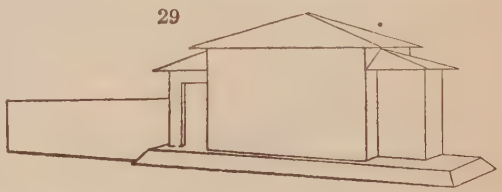

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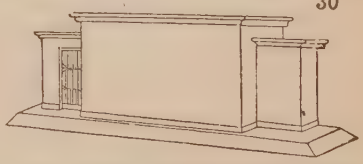
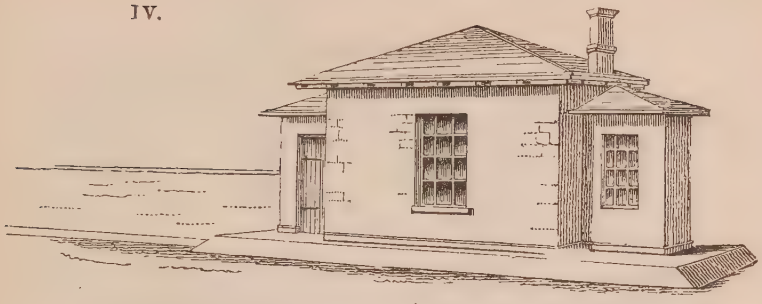
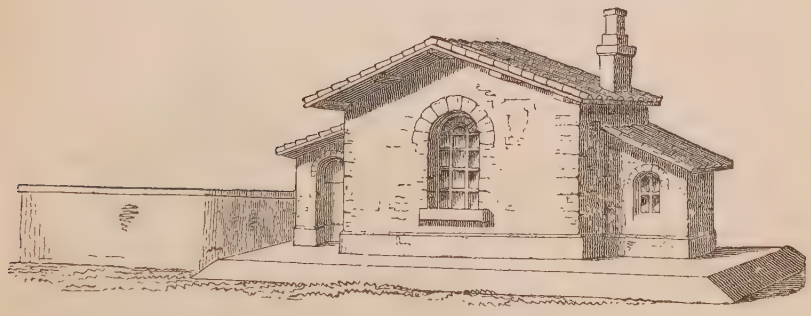
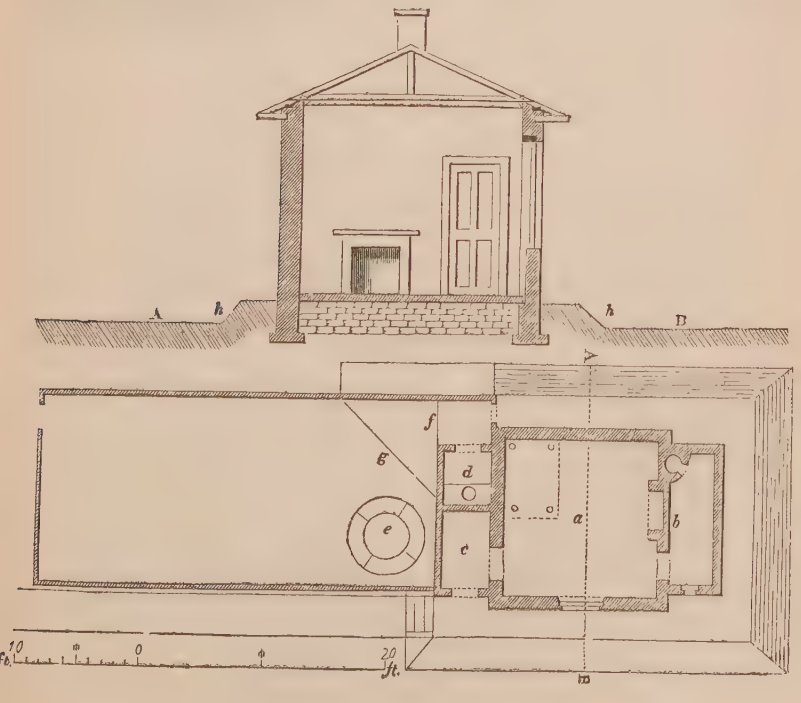


60. *Expression.* A plain cottage, like the present, cannot be said to be in any particular style of architecture; though it belongs more to the Grecian than to the Gothic, from the proportions of the windows, and from the blocks or cantilevers, fig. 27, *i*, supporting, or seeming to support, the eaves of the roof. If the door and the two windows had Grecian architraves and mouldings (masonry supposed to be in imitation of the original beams

IV.







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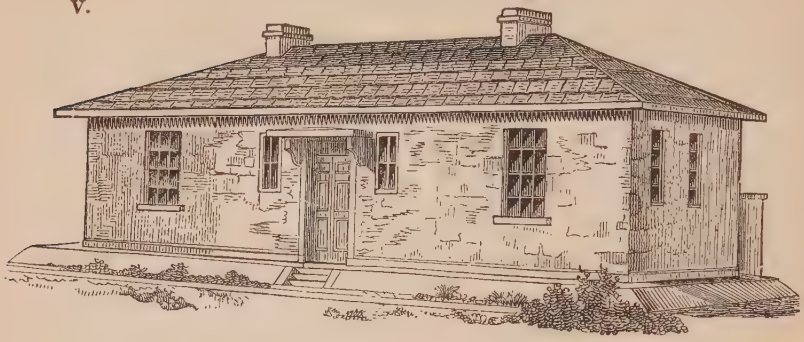

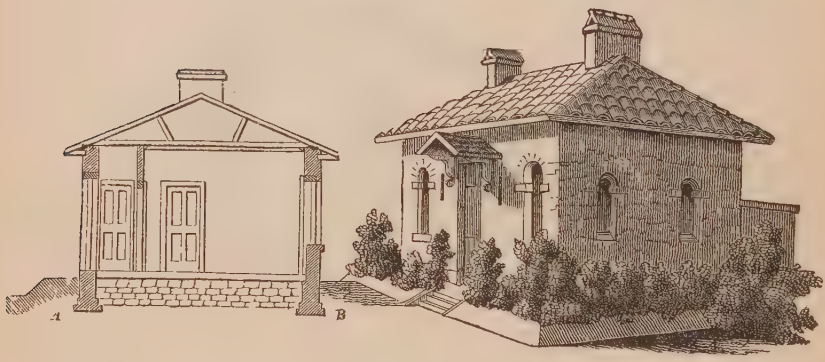

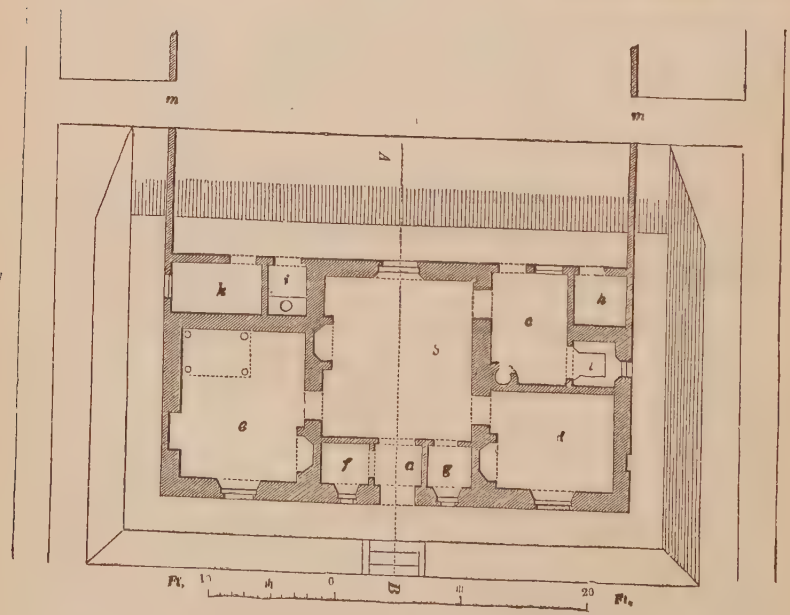

which, in rude huts, formed the sides and covers to openings, fig. 28), the building would then lay claim to be called a cottage in the Grecian style; but being without these, it has little or no expression of style, but simply an expression of the subject, or purpose, for which it was built; that is, to serve as a cottage, or human dwelling of the humblest kind. The glass windows, the door for security, and the chimney top, clearly show this edifice to be a human dwelling; and its size, as decidedly determines it to be one of the humblest description, or what is called a cottage. Remove the windows and the chimney top, leaving the entrance opening without a door, fig. 29, and it might be taken for a cattle-shed and yard. Remove the roof, and replace the door, fig. 30, and it might pass for a place of burial. Restore the glass windows, increase the height of the principal one, and replace the roof with a little alteration, adding on its summit a turret and bell, fig. 31, and this structure might be mistaken for a chapel. We state these things simply for the purpose of showing what is meant by expression of the subject, in contradistinction to what is meant by expression of architectural style.

31

Design V.—*A Dwelling for a Man and his Wife with Two or more Children, with a Cow-house and Pigsty.*

61. *Accommodation.* This is a simple, economical, and comfortable dwelling, without pretensions either to ornament or style. It contains an entrance lobby, *a*; kitchen, *b*; back kitchen, *c*; children's bed-room, *d*; bed-room for the father and mother, and the infant children, *e*; tool house, *f*; pantry, *g*; place for fuel, *h*; privy, *i*; cow-house, *k*; and dairy, *l*. There is a yard behind the house containing a pigsty and the manure well. This yard is entered from the back kitchen, *c*; and also by doors in its boundary fence, *m*.

62. *Construction.* The walls may be of stone, brick, or earth; the two former materials will not only be found more suitable in reality, but more satisfactory to the eye: for walls of earth, when not whitewashed, have always a mean appearance, from the inferiority of the material; and when whitewashed, this meanness, though concealed, is still known to exist; for no building was ever whitewashed, but for the purpose of concealing something, and every one must feel, with Wood, that the grandeur or the beauty of any building is never heightened by this operation. "The world in general," says this philosophical artist, "is exceedingly unwilling to acknowledge beauty of form when the material is bad; and, on the other hand, where the materials are good, it is ready to praise the form also; the one is a much more obvious and indisputable merit than the other." (*Letters, &c. Vol. II. p.* 96.) Where white-washing or lime-washing a building, with any colour, contributes to the preservation of the wall, it is justifiable; but no genuine lover of truth will ever admit that this operation can add to the beauty or character of a building. The idea which it conveys of the neatness and cleanliness of the inhabitant is its principal recommendation; and yet it is a fact, that where lime-washing is most employed, as in Wales and Scotland, the interiors of the cottages are less orderly and clean, than in the unwhitened mud and rough stone cottages of England.

63. *The Cow-house* in this Design is placed under the same roof with the dwelling apartments, but with its floor a few inches lower, so as to be on a level with the platform. That part of the platform on which the cow-house opens ought always to be connected with an enclosed yard; and instead of sloping down to the general surface level at an angle of 45° or 50°, it ought to slope, as shown in the Section on the line A B, at an angle not exceeding 15°. The whole of the enclosed yard ought either to be paved, macadamized, or gravelled; and the surface ought to be so inclined as to carry all the water which falls on it, to the manure pit and well. The floor of the cow-house ought to be perfectly level and smooth, so as that it may never be necessary to employ litter. The gutter ought to be formed about a foot broad, and four inches deep, and exactly behind the cow's heels. This will be from seven to eight feet from the feeding-trough at her head, according to the size of the cow; but the details on this subject will be found in our second Book.

64. *The Roof* is shown of a low pitch, and covered with slates. The chimney tops are quite plain; and, in our opinion, they, and most of the other chimney tops in the Designs

hitherto published, are too short. The principle of truth, or a thing appearing to be what it is, and the expression of purpose, alike require that, in all human dwellings in temperate climates, intended to appear as such, the chimney tops should be conspicuous objects. We would, therefore, recommend them, in all cases, to rise boldly into the air above the roof, and to form a conspicuous feature in the outlines of all buildings against the sky. As a palliative for the evil of a stack of chimneys being too short, architectural chimney pots may be employed. Of these there are a great variety of forms made of cement, artificial stone, or earthenware. We shall give numerous specimens in the course of this work, and, in the mean time, present one, fig. 32, which may answer very well for the Design before us, and which was furnished us by Mr. Austin, from his artificial stone manufactory, in the New Road, London. Much of the effect of chimney pots, vases, and all ornaments of this sort, depends on their being raised on suitable plinths (a square plate, originally a square tile, placed under the base of a column, or other object), fig. 33, *a*.

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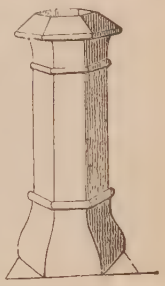
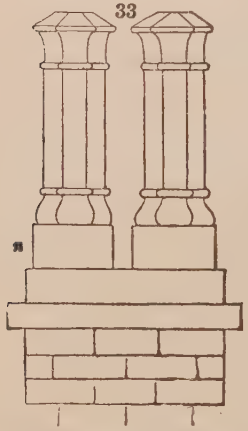


65. *The Door-way* in this Design is protected from the perpendicular rain by what is called a door-bracket, fig. 34, which, considering that there is a lobby or vestibule within, may, perhaps, serve as a substitute for a projecting porch; for, as we have before observed, whenever comfort is the object, there ought either to be a porch, or a lobby; and in every exposed situation, both are desirable. That the porch should always partake of the expression of the main body of the building is sufficiently obvious; and not less so that it should be enhanced in the expression of Design in order that it may be rendered conspicuous and inviting.

33



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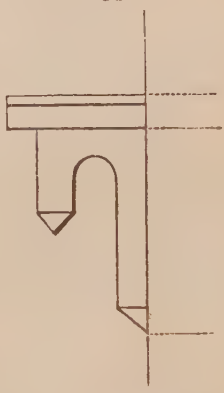


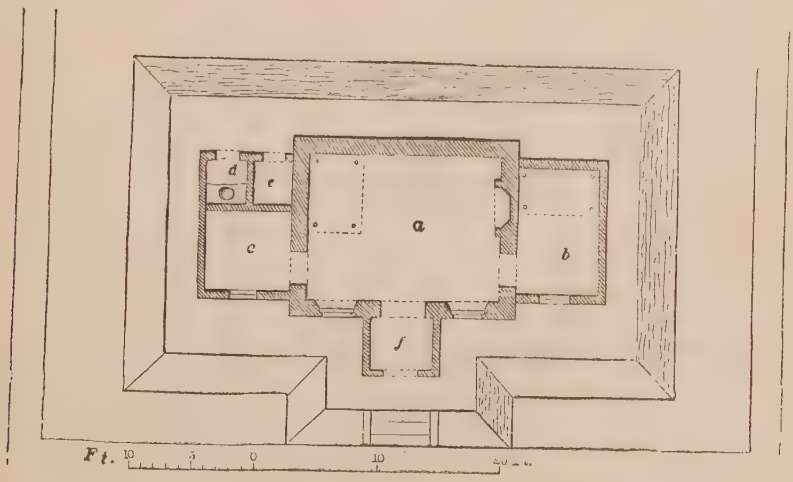
66. *Situation.* This building is not calculated for being placed in a situation where it will be seen from all sides; because the yard-wall, and the irregular size and position of the openings which look into it, have less of the character of architectural design than the front and ends. If it be placed near a road, therefore, the entrance side and end should first meet the eye as in the perspective elevation before us.

67. *General Estimate*, 11,700 cubic feet, at 6*d.* per foot, £292 : 10*s.*; at 4*d.*, £195; and at 3*d.*, £146 : 5*s.*

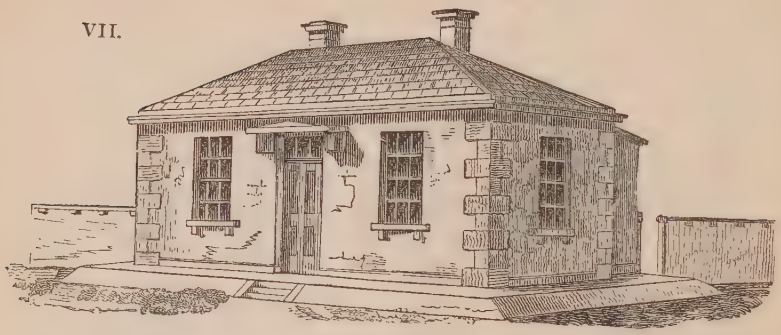
35

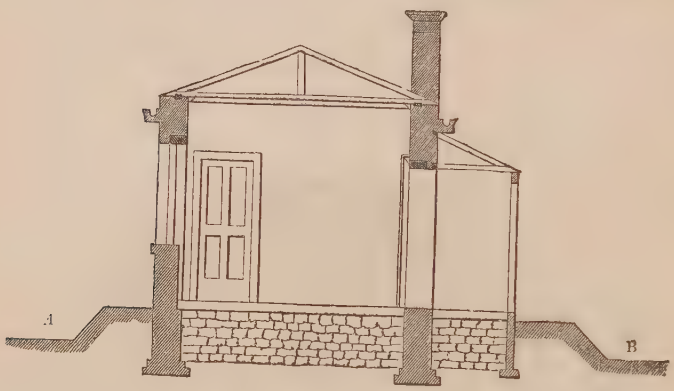
68. *Expression.* Nothing here can be considered as superadded to the expression of the subject. A degree of ornament and elegance might be conferred by handsome chimney pots as suggested above, and by a low fence round the terrace, fig. 35; but, for the latter, might very well be substituted a box hedge, which the cottager might keep neatly cut and ornamented by verdant figures at the corners, &c.

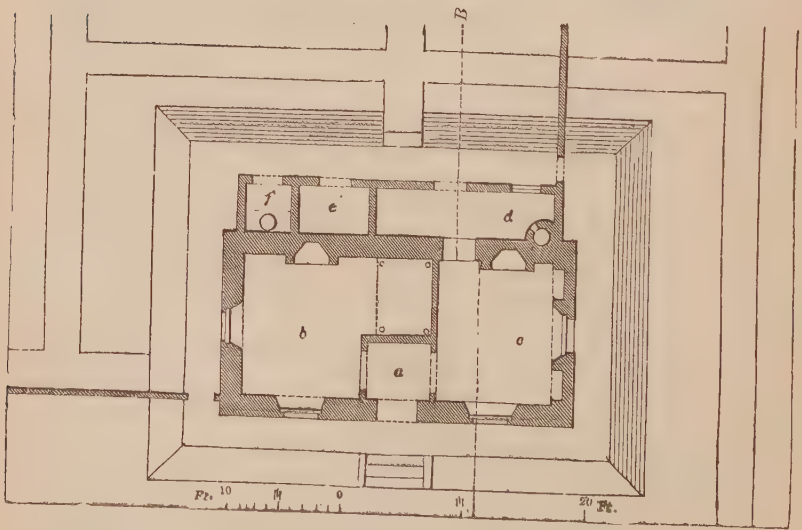
VI.



VII.







Design VI.—*A Dwelling for a Man and his Wife with an Apprentice, Servant, or grown-up Son or Daughter.*

69. *Accommodation.* This neat little dwelling contains only one large room or kitchen, *a;* a small bed-room for the master and mistress, *b;* and a store closet, *c.* Included under the lean-to at one end, is a privy, *d,* and a place for fuel, *e,* and there is a porch in front, *f.* The servant, or grown-up son, or daughter, is supposed to sleep in the large living room, or kitchen, in which, the situation of a bed is indicated; it being frequently requisite in the case of gate-houses, ferries, or bridges, to have one of the inmates sleeping near the door, for the convenience of rising in the night-time to open the gate, take toll, &c. The use of the space between the ceiling and the roof may be obtained by having a trap door over the porch.

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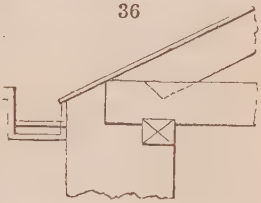
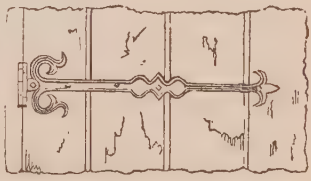


70. *Construction.* The walls may be either of brick or of stone. The roof may be covered with slates, projecting a few inches over the walls, and delivering the water into a gutter, fig. 36. The doors are ledged, and hung with ornamental hinges (fig. 37, to a scale of three quarters of an inch to a foot), fixed on the outside.

37



71. *General Estimate.* Cubic contents, 5,230 feet, at 6*d.* per foot, £130 : 15*s.*; at 4*d.*, £87 : 3*s* : 4*d.*; and at 3*d.*, £65 : 7*s* : 6*d.*

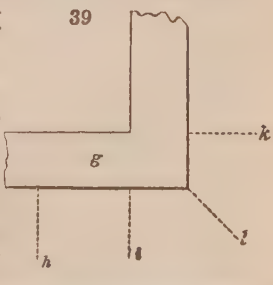
72. *Expression.* There is obviously something more intended here than the mere expression of the subject. The peculiarity of the hinges of the door, the small loop-hole opening over it, and the pinnacle by which the gable end is terminated, are intended to give some character or expression of style to this cottage; though we cannot refer to any known sub-style or manner which may be considered its prototype. The elevation, however, presents a very neat whole, and though not striking, is at least agreeable. It might be enriched by suitable chimney pots, and to be complete, ought to have a parapet on the terrace, fig. 38.

38

Design VII.—*A Dwelling of Two Rooms, and a back Kitchen, for a Man and his Wife.*

73. *Accommodation.* This dwelling is deficient in closets, which are always more or less useful, either in a small house or a large one; it is, however, substantially built, and comfortable. There is an entrance lobby, *a;* a room, *b,* containing a bed, which may serve also for a working room, and which, in Scotland, very generally serves for a parlour; a kitchen, *c,* well lighted, and with two cupboards; and a back kitchen, *d,* which forms part of a lean-to. One end of this back kitchen may be partitioned off as a pantry. In the lean-to there is also a place for fuel, *e,* and a privy, *f;* which last communicates by a drain with the well of the dung-pit.

39



74. *Construction.* The walls may be built of rubble stone, with rusticated corners (that is, the joints channelled, or cut in grooves), as shown in the elevation; and as is very generally practised in countries abounding with free stone. There is an obvious propriety in the practice of building the corners with large and square stones; because the corner of a building, from being exposed to the weather, and to accidents from coming in contact with persons or objects on two sides, in order to be equal in durability with the general face of the wall, must be formed of a more solid, homogeneous material. It is not, as some might suppose, that the corners require to be built thicker than

the other parts of the walls in order to be stronger; for the corner, from its very position, is always the strongest part of the wall. Thus, a force applied to the wall, *g*, in the direction of *h*, fig. 39, is resisted only by the thickness of the wall; but a force applied at *i* or *k*, is resisted by the thickness of the wall, backed by its length; and a force applied at *l*, is resisted by the length of both walls. The walls in this Design are finished with what is called a blocking course, fig. 40, *m*, over which the slates of the roof project so as to throw the water into a gutter, formed in the upper surface of what is called the wall head plinth, *n*. This is a very common mode of roofing and finishing stone-built, slate-covered cottages, in Scotland; where it is found both economical and durable. The chimney stacks are formed of hewn stone, finished with a simple cornice (fig. 41, to a scale of one inch and a half to a foot). In the section A B, in Design VII. it will be observed that the part of the platform which is under the house, is formed of stones; the object being to keep the floor dry, and to admit, if it should be thought necessary, of forming a flue in it.

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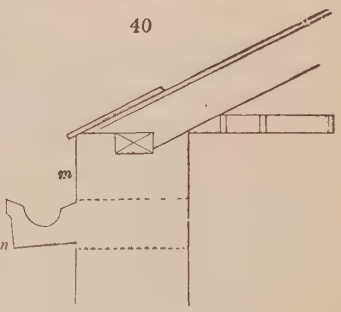


41

75. *Situation.* A cottage with this description of roof is peculiarly adapted for an elevated situation, much exposed to storms; it being impossible for the wind to get under a roof like this, which has no eaves.

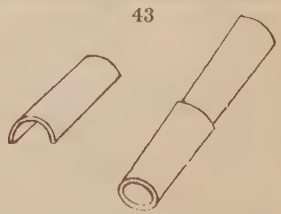
76. *Fitness.* A great fault in this dwelling is, that the fire-places are in the side wall, and though they are in part protected by the lean-to, yet the heat thrown into that part of the building may be considered in a great measure lost, or of no great use. It would be an improvement to transpose *e* and *f*, as the heat given out behind the fire-place of *b*, would then be turned to some account.

77. *Expression.* There is very little more here than the expression of the subject. What there is, belongs to local manner, and that manner being common in Scotland, the dwelling before us may very well be termed a stone cottage in the common Scotch manner. This manner can by no means be commended in point of beauty; but it might be improved both in appearance and usefulness, by the addition of a porch; a parapet to the terrace, and a vase over the porch, to bring those on the parapet, and the chimney pots into harmony, fig. 42. Vases for these purposes, of various forms and dimensions, are to be had from the potters, at a few shillings each.

42

78. *Specification.* In the following detailed specification, the walls are supposed to be built of stone, with brick coins instead of squared stones. As a number of technical terms are necessarily made use of in these details, we have explained them as they occur; and the engravings which we have made use of in aid of this purpose, are to be considered as merely explanatory, and not drawn to any scale, like those illustrative of the construction of the different Designs.

43



79. *Specification of Bricklayer's Work.* To dig out the several trenches for the foundations of the respective depth and width required; and to fill in and well ram in the earth round the foundations when built. To dig and steen (to line with brick or stone) in four-inch brick-work, a cesspool for the privy four feet in diameter in the clear, and six feet deep; and to dome (arch over) the same in nine-inch brick-work; and put in four feet of twelve-inch hollow tile drain, fig. 43, with a proper fall to convey the soil to it. To build

all the foundations and the cross-wall under the bed-room floor, and the external walls with stones properly headed (squared at the ends) and prepared (so as to lie flat), laid in random courses (courses of unequal height, fig. 44); the external face with a neat garreted

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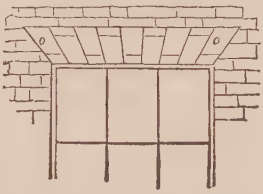

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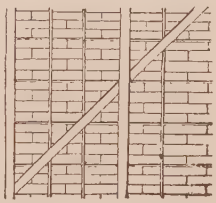
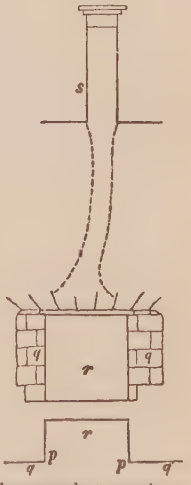


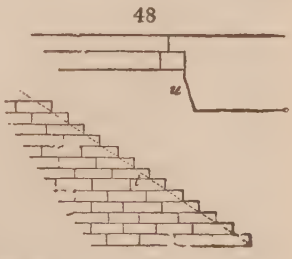
joint (the joint stuck with small pieces of stone), with brick coins (corners) and common skewback (a bevelled abutment, fig. 45, *o o*,) brick arches, set in Roman cement, over the doors and windows. The back kitchen, fuel-house, and privy, to be carried up in four-inch brick-work. To fill in the cross partitions with four-inch brick nogging flat (bricks laid flat, or in bed, fixed between, and flush, i. e. even, with the stud-work, fig. 46). To build nine-inch brick spandrils and steps to the front door, with proper foundations. (The span of an arch is the distance between the two points from whence it springs, and spandrils for door steps are the arches, or the walls, which support the ends of the steps). To build the chimney jambs (sides, fig. 47, *p*), breasts (fronts, *q*), backs, *r*, and shafts, *s*, in brick-work, with flues, nine inches by fourteen inches in the clear; properly gathered and pargetted (plastered in the inside with a mixture of common lime mortar, fresh cow-dung, and loam); and provide an additional flue for a copper (boiler). The fire-places to have each a strong iron chimney-bar (bar for supporting the breast-work, or front side of the flues). All the door and window-frames to be properly bedded (placed in mortar), and pointed (the joints neatly closed) with good lime and hair mortar. To pave the kitchen and entrance with good paving bricks, bedded and jointed in mortar; wheeling in stones and gravel, which are to be well rammed in and consolidated, in sufficient quantity to raise the floor to the level shewn in the section; and to pave the back kitchen, fuel-house, and privy, with common stocks, bedded in sand: the whole to be properly currented (laid to such a slope as to carry off the water). The bricklayer is to find scaffolding and ladders, and to fix and refix the same, as occasion may require; and to cut the chasings (to cut into the brick-work) for lead, and all rakes (to cut a rake, is to reduce to a smooth slope the face of brick-work which has been left in a rough slope, as indicated by the dotted line, fig. 48, *t*), and splays (a splay signifies a return of work deviating from a right angle, and is generally applied to the bevelled jambs of windows and doors, as at *u*, in fig. 48) required; and make good (reinstate what may have been deranged during the operations); and, from time to time, to clear away the rubbish arising from the work during its progress. The bricklayer is to find all materials; lime, sand, tackle, carriage, and labour, for the completion of the foregoing works in a sound and workmanlike manner.

47



80. *Specification of Plasterer's Work.* To colour twice over, in a good warm-tinted stone colour, the brick coins, arches, chimney shafts, and the exterior of the back kitchen, fuel-house, and privy. To lathe (to nail on the laths), lay, set, and whiten, the ceilings of the kitchen, bed-room, and entrance; and render set (first and second coats of plaster in two-coat work) the walls and partitions, and lime-white (whitewash) twice over the back kitchen, fuel-house, and privy inside. The plasterer is to find all materials, tools, carriage, and workmanship required for the completion of his work; and to do the same in a workmanlike manner

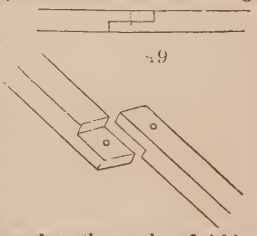
48



81. *Specification of Slater's Work.* To cover the whole of the roofing with Countess slating (the third size of Welch slates, see *Slates*, in *Glossarial Index*), nailed with painted iron nails, and the eaves to be laid double. The whole to be laid with a sufficient lap, and to be carefully sorted in courses (laid so as that the joints may form regular lines), so as effectually to exclude the weather. The slater is to find all materials, tools, carriage, and labour required for the completion of his work, and to do the same in a workmanlike manner.

82. *Specification of Stone-Mason's Work.* To put Yorkshire stone quarry sills, eight inches wide, bevelled (sloped), throated (grooved underneath), and tooled (hewn, but not rubbed afterwards, as is done occasionally to produce a finer surface), to all the windows. To put a Yorkshire stone hearth and slab to the bed-room fireplace; and plain Portland stone mantels (the cross pieces which bear on the jambs), jambs, slips (sides of the jambs), and shelves to both the fireplaces. The mason is to find all materials, carriage, and work, required for the completion and fixing of his work, in a sound and workmanlike manner.

83. *Specification of Carpenter's and Joiner's Work.* Carpenter's work. The work to be done with sound, well-seasoned, Quebec red pine timber, except where otherwise specified. The whole to be framed in a workmanlike manner, with the stuff (pieces of timber) sawed square of the several scantlings (dimension of breadth and thickness), and descriptions as follows:—all the carpenter's work, as well as the joiner's work, to hold the several scantlings (dimensions, see *Glossarial Index*), and thicknesses herein named, when finished. To put oak lintels (correctly, the head pieces over doors or windows, which rest upon the jambs; in brick buildings generally a short beam over the head of a door or window resting on the jambs, to carry work that does not receive support from an arch), three inches and a half thick, to all the openings, of the width of the respective walls, less the thickness of the brick arches, so as to lay nine inches on the walls at each end. Oak wood bricks (pieces of oak timber, cut to the size and shape of bricks, and built into the inner surface of walls for the purpose of nailing joiner's work to them, when finishing the rooms), to be provided in the jambs for fixing the linings (thin boards) where required.



—Bed-room floor. To put oak joists, four inches by three inches, and twelve inches apart, laid on two-inch oak sleepers, four inches wide.—Ceiling floor. To put an oak wall plate, four inches by two inches and a half, dovetailed (see fig. 57) at the angles, and halved and spiked (a mode of joining, fig. 49) at the laps; and ceiling joists, joggled on (fixed, as shown in fig. 50), and spiked

50

51

(nailed with spike nails, fig. 51) at each end, to the top of the plate, four inches by two inches, and twelve inches apart; the two end bays (spaces betwixt the girders, or principal timbers in a floor) to be framed at one end into the binding joists, five inches by three inches, fig. 52, *v*.—Roofing. To put one inch and half yellow deal hip rafters (rafters at the angles of a pavillion roof), and ridge pieces, nine inches deep (fig. 53, *w*), rounded on the top for lead. Common rafters, four inches by two inches and a half, and thirteen inches apart; with two pair of couplings, five inches by three inches, fig. 54, *x*, framed to the binding joists, or tie beams (horizontal pieces of timber, *y*), and spiked to the face of them at each end, having king-posts (perpendicular posts, *z*), six inches by two inches and a half. The whole properly trimmed (framed round, leaving a clear opening,) to the chimney shafts. The shed roof over the back kitchen, fuel-house, and privy, to have

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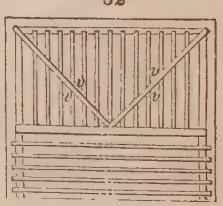
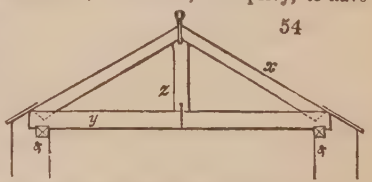


53

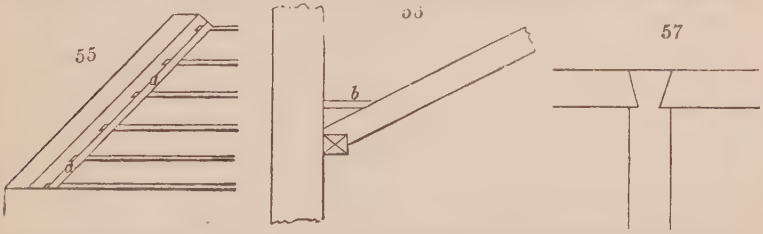
rafters, wall plates (pieces of timber on the walls, on which the rafters rest, fig. 54 & &), and ties of the same scantling as above described. The whole of the roofs to be covered with three quarters of an inch thick yellow deal slips (boards), two

54

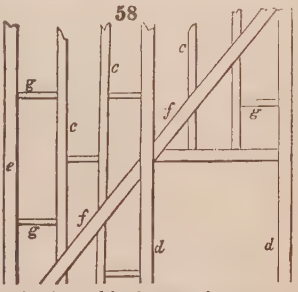


inches and a half wide, for Countess slates; with proper tilting fillets (tilting fillets are used

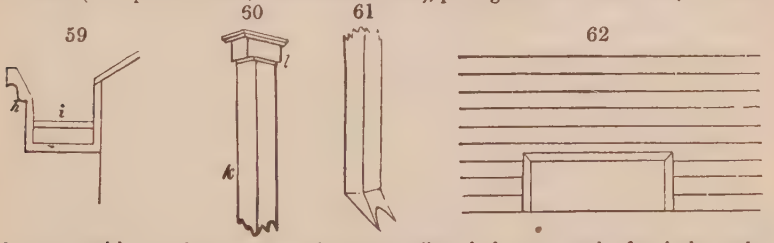
.o give a slight inclination to the verge or border-slates, where they butt against brick-work, is at *a*, in fig. 55, in order that the water may be directed from the brick-work; they are



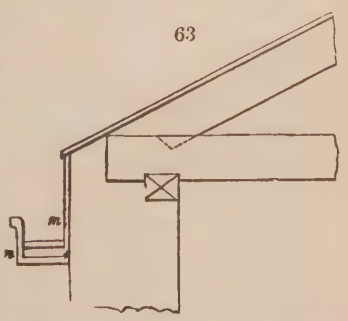
likewise employed to steady and support the lower edges of slates finishing against vallies; the usual size is three inches wide, three-eighths of an inch thick, and feather-edged); and one inch and a quarter feather-edged (thin edged) eaves' board, eight inches wide. Put one inch yellow deal gutters, and bearers (pieces of scantling to support the gutters. fig. 56, *b*,) to the chimneys. The internal partitions to be made for nogging flat (the same as in fig. 46, but with the bricks set on edge). Put heads, four inches by three inches, dovetailed, fig. 57, into the plates; sills of oak, four inches by two inches and a half; common quarters, fig. 58. *c*, four inches by two inches, and eighteen inches apart; door-posts, *d*; principal quarters (principal upright pieces of timber in the partition, *e*), and braces (diagonal pieces of timber, *f*), four inches by three inches; nogging pieces, *g*, four by two inches.



84. *Specification of Joiner's Work.* All the inside framing, and all the outside work, to be of sound, well-seasoned, dry, yellow deal. To put one inch and a quarter moulded fascia (fig. 59, *h*), with an inch thick gutter having a false bottom, *i*, to current the water (to slope the bottom, so as to make it run), put together with white lead, all round



the eaves, with two three-quarters of an inch yellow deal water trunks, four inches and a half square (wooden pipes to conduct the water down, fig. 60, *k*), with head, *l*, and shoes, fig. 61, to deliver the water to the ground. To lay in the bed-rooms one-inch folding floors (a particular mode of laying down the boards; but when finished, the appearance presents nothing particular; fig. 62. See folding floors, in *Glossarial Index*), with border to the slab.—[In the specification of the gutter for carrying off the water from the roof, there is a deviation from the section, fig. 40, in p. 36, in which the gutter is formed in stone, being hollowed out of the wall-head plinths. The reason why this deviation has been made, is, that the specification was drawn up with the view of erecting the cottage in the neighbourhood of London, where a stone gutter would have added greatly to its expense. The wooden gutter shown in the section, fig. 63, will produce the same effect, and correspond with the specification.]—Doors. To put proper door-cases (door-cases are called proper, when wrought, i. e. planed, framed, rebated, and beaded,) of fir (fir is generally applied by builders



to Baltic timber; what they call pine generally comes from America, and is of inferior quality), four inches and a half by three inches, and oak sills to all the external doors, with one inch and a half six-panelled bead, butt and square door (a door framed on one side without any moulding; on the other the panel is flush with the stiles, and has a bead run on the edge, butting against the rails, fig. 64, *m*, *m*, *m*,) to the entrance, hung with three-inch butts (hinges, fig. 65); and one and a quarter inch proper ledged door (a proper ledged door has the boards planed, tongued into each other, see *Index*, and beaded; they are placed vertically, and nailed to horizontal pieces at the back, called ledges,) to the back kitchen, fuel-house, and privy, hung with sixteen-inch cross garnet hinges (a hinge with a bar, fig. 66); the whole to have Norfolk thumb latches (latches lifted by the thumb, fig. 67), and eight-inch rod bolts, fig. 68; and, except the privy, eight-inch fine plate stock locks (locks with a wooden back, or stock, fig. 69). The internal doors to be one inch and a quarter six-panelled, both sides square, with two inches and a half butt hinges, and six-inch iron rim brass knob locks, fig. 70.—Windows. To put an oak solid two-light proper frame, three inches by two inches, with cast-iron casements, made to open with strong hinges, latches and spring stay-irons (irons to keep the window open) to the back kitchen.—[We have shown in the elevation, sash windows, greatly preferring them to casements; but as the object was to erect the building at as little cost as possible, casements were substituted in the scullery window, &c.]—The windows in the kitchen and bed-room to have deal cased frames (frames with wooden cases formed at the back of the pulley stiles for the sash weights to hang in) oak sunk sills (the upper part of the sill sunk, or grooved out, in order to prevent the rain from driving under the sash) one inch and a half ovolo sashes (the sash-bars with ovolo mouldings, fig. 71); double hung, with white lines, iron weights, and brass pulleys, with brass spring fastenings, fig. 72. All the windows to have inch wrought and rounded window boards, (a narrow shelf in the interior at the bottom of the sash, fig. 73, *n*,) with three quarters of an inch splayed lining and soffits, *o*, with ogee mouldings, and fillets on the edge, *p*. The doors also inside to have one inch and a quarter single rebated jamb linings, with mouldings to match. To put inch clamped (cross-headed, *q*) folding shutters, with rule joints (joints like those of the common foot rule), and proper hinges to the window, with iron bar fastenings. To put three quarters of an inch square skirting, (a skirting-board without any moulding at top), four inches high, fig. 74, in the bed-room, with inch narrow bevelled grounds (slips of wood to fix the skirting to, having the upper edge bevelled back, in order to retain the margin of the plaster, fig. 75, *r*), plugged to the walls (nailed to plugs of wood driven into the walls). To put an inch deal seat riser (the front board on edge), and bearers (cross pieces), with water board hole and a cover, to the privy, and three quarters of an inch skirting at back of the seat, six inches high.—[We have before, in Chapter I., recommended a hinged flap, or lid, in addition to the round cover which fits into the hole, with a view the more completely to exclude smell; an object which ought, if possible, to be effected, at whatever cost. For this reason, we would always recommend the introduction of a smooth earthenware basin, with a tube, which may reach down into the soil, under the seat

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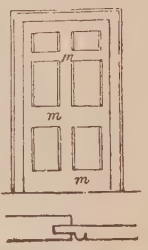

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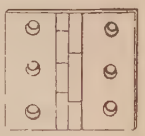

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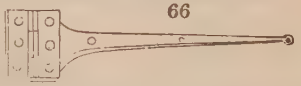

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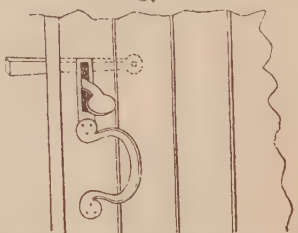

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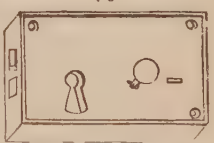

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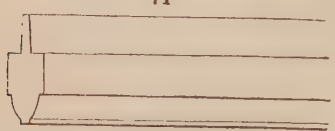

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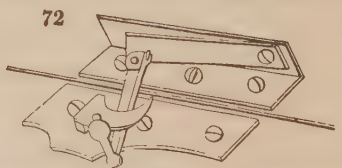

in order to diminish the evaporating surface, and prevent the possibility of a current of air rising through the opening.]—To put three tier of inch shelves in each of the recesses in the kitchen. The carpenter and joiner to find all materials, ironmongery, carriage, and labour for the completion of his work, and to do the whole in a sound and workmanlike manner.

73

85. *Plumber's, Painter's, and Glazier's Work.* To put flashings (strips) of milled lead (lead that is pressed out to the required thickness by a machine), eight inches wide, five pounds to the foot superficial, chased (let) into the brick-work, and fixed with wall-hooks, fig. 76, to the chimney shafts, with proper aprons (pieces of lead to overlap the flashings, fig. 77, *s*), and cover the gutters with lead seven pounds to the foot superficial. To cover the hips and ridges with milled lead, fifteen inches wide, five pounds to the foot superficial, properly lapped, dressed, and nailed with lead-headed nails (nails with their heads enveloped in lead, by dipping them in melted lead, in order to prevent their rusting). To glaze and back putty, (to remove the putty pressed out of the rebate by the pane), all the sashes and casements with good second (second in quality) Newcastle crown glass. To paint the whole of the external woodwork, and the gutters, and shoots (spouts), inside four times in good white lead and oil; the external doors to be finished in an oak, or in a stone colour. To paint the sashes, frames, shutters, linings, and skirting, inside the house, three times in oil. The plumber, painter, and glazier, to find all workmanship, materials, and the carriage thereof; and every thing requisite for the performance of his work, and to do the same in a perfect and workmanlike manner.

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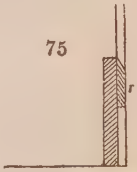

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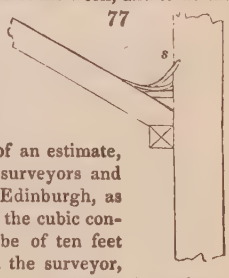


86. *Well, Pump, and Platform.* The above specification is exclusive of a well and pump, also of a copper boiler, and setting it, and of the bringing of the earth, and forming the platform or terrace round the house.

87. *Estimate.* The following is the form of an estimate, framed on the above specification, as made by surveyors and builders. The architects about London and Edinburgh, as we have before observed, generally estimate by the cubic contents; first making a calculation of what a cube of ten feet square will cost on each separate story; but the surveyor, whose business it is to measure buildings, and to estimate the value of the labour and materials, goes into minute details. He does not, however, in giving in an estimate, specify to his employer the value which he puts on every particular item; but only the total amounts of the different works generally executed by separate tradesmen, in the following form:

88. *Estimate of Bricklayer's Work.* £ s. d.

Nine cubic yards of digging, filling, and ramming; seven cubic yards of wheeling in stones and gravel, to level the ground under the kitchen floor.....

One hundred and ninety-seven feet of reduced brick-work, (in estimating the price of brick-work in Britain, the quantity, of whatever nature and thickness it may be, is always reduced to walls of one and a half brick in thickness, two hundred and seventy-two and a quarter square feet of which form a rod of brick-work).....

One rod, eighty-two feet of reduced stone-work (the stone walls are reduced to one and a half brick in thickness).....

Two rods, two hundred and twenty-five feet of reduced stone-work above ground, with brick coins and garreted joints.....

Twenty-nine yards of brick nogging flat.....

Ten and a half yards of common stock paving in sand .....

Sixteen yards of paving bricks bedded and jointed in mortar.....

Eight feet run (lineal measure) of chasings for lead.....

Forty feet of cutting splays.....
Four feet of twelve-inch hollow tile drain.....
Digging and steening in four-inch brick-work a cesspool, four feet diameter in the clear, and six feet deep.....
Paved slope to the drain in the privy.....
Two iron chimney bars.....
Twelve common brick arches, set in cement.....
Nine window and door frames, bedded and pointed.....

£70 : 3 : 3

89. *Estimate of Plasterer's Work.*

Thirty-two yards of whitewashing to new work.....
Sixty-two yards of whitewashing twice over.....
Forty-five yards of stone-colouring twice over.....
One hundred and twenty-one and a third yards of render-set plastering.
Thirty-two yards of lathlay set plastering.....

£10 : 7 : 2

90. *Estimate of Slater's Work.*

Eight squares (one hundred square feet each) of Countess slating, with painted nails.....

£13 : 12 : 0

91. *Estimate of Stone-Mason's Work.*

Twelve feet four inches, superficial, of Yorkshire hearth-stone.....
Twenty feet eight inches, superficial, of Portland stone chimney pieces
Sixteen feet three inches, lineal measure, of quarry Yorkshire sills, eight inches wide, bevelled and throated.....

£4 : 0 : 6

92. *Estimate of Carpenter's and Joiner's Work.*

Sixteen cubic feet four inches of oak timber in lintels, plates, &c....
Thirteen cubic feet eleven inches of oak timber, framed in joists, &c.
Ninety-one cubic feet one inch of Quebec red pine timber, framed in roof and ceiling floor.....
Nine superficial feet of one-inch gutter-board and bearers.....
Seventy-one superficial feet nine inches of one and a quarter inch feather-edged eaves board rounded.....
Forty-eight superficial feet nine inches of one and a half inch yellow deal hips, and ridge rounded.....
Four superficial feet of two inch oak sleepers.....
Six squares and fifty-seven feet, superficial measure, of slips for Countess slates, two and a half inches wide.....
Wooden bricks.....
One hole cut, one water board, and one cover.....

£30 : 15 : 4

93. *Estimate of Joiner's Work.*

Six cubic feet seven inches fir timber in proper (according to specification) door-cases.....
One cubic foot four inches of oak timber, in sills.....
Ten cubic inches of oak, proper, in two light frames.....
Seventeen superficial feet nine inches of three-quarters of an inch square skirting.....
Ninety-three superficial feet ten inches of three-quarters of an inch splayed linings and soffits.....
Thirteen superficial feet six inches of inch shelves.....
Twelve superficial feet of inch seat and riser.....
Twelve superficial feet nine inches of inch wrought and rounded window board.....
Eighty-six superficial feet of inch clamped folding shutters and hinges
Sixty-four superficial feet six inches of inch gutter, with false bottoms and bearers, put together with white lead.....

One square and fifty-seven superficial feet of inch yellow deal folding floor.....
Forty-nine superficial feet four inches of one and quarter inch fascia wrought.....
Fifty-three superficial feet three inches of one and a quarter inch proper ledged doors.....
Fifty-eight superficial feet six inches of one and a quarter inch six-panelled bead butt and square doors.....
Twenty-one superficial feet of one and a half inch six-panelled bead, butt, and square door.....
Eighty-one superficial feet ten inches of one and a half inch deal cased frames, oak sunk sills, with one and a half inch ovolo sashes, double-hung with white lines, iron weights and brass pulleys.....
Thirty-nine lineal feet six inches of narrow grounds and plugging.....
One hundred and fifty-seven lineal feet of ogee and fillet moulding.....
Twenty-two lineal feet of three-quarters of an inch deal water trunk, four and a half inches square.....

94. *Estimate of Ironmongery and Fixings.*

Three pair of two and a half inch butt hinges, and screws for fixing them
One pair of three-inch butt hinges, and screws for fixing them.....
Three pair of sixteen-inch cross garnet hinges.....
Four Norfolk latches.....
Three eight-inch Stock locks.....
Four eight-inch bright rod bolts.....
Three six-inch iron rim brass knob locks.....
Four spring sash fastenings.....
Two cast-iron casements.....
Two stay-irons.....
Five shutter bars.....

£38 : 8 : 7

95. *Estimate of Plumber's, Painter's, and Glazier's Work.*

Four cwt. two quarters of milled lead.....
Fifty-two superficial feet three inches of second Newcastle crown glass.....
Fifty-one and a half yards three times painted in oil.....
Twenty-eight yards four times painted in oil.....
Eleven yards four times painted in oil, of a stone or oak colour.....
Thirty-nine lineal feet six inches of inch skirting, four and a half inches wide.....
Four dozen squares and frames, three times painted in oil.....
One two-light square and frame, three times painted in oil.....
Two casements, three times painted in oil.....
Four dozen squares and frames, four times painted in oil.....
One two-light frame, four times painted in oil.....
Two casements, four times painted in oil.....
Two stay-irons, four times painted in oil.....

£14 : 13 : 4

96. *Summary of Estimates.*

Bricklayer.....	£70 : 3 : 3
Plasterer.....	10 : 7 : 2
Slater.....	13 : 12 : 0
Stone-Mason.....	4 : 0 : 6
Carpenter, Joiner, and Ironmonger.....	69 : 3 : 11
Plumber, Painter, and Glazier.....	14 : 13 : 4
	£182 : 0 : 2

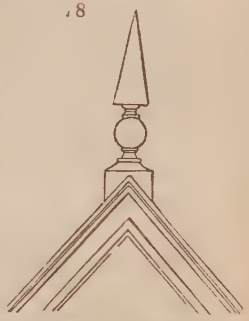
97. *Estimate from the Cubic Contents.* This dwelling contains 7,305 cubic feet, which, at £182 for the whole, is between 5¾*d.* and 6*d.* per foot; but, as before observed, contractors about London generally deduct a per centage from their estimates, according to the kind of building to be erected: this per centage, for ornamental buildings, is about ten per cent.; but plain buildings, such as the one above given, may admit of a deduction from the estimate of fifteen per cent., which would reduce the amount to about £155.

Design VIII. — *A Dwelling of Two Rooms, for a Man and his Wife.*

98. *Accommodation.* This dwelling, though small, will be found suitable for those situations where neatness, with some little appearance of improved design, is an object. It contains a kitchen, *a*, well lighted, and with two closets; a bed-room, *b*, with a recess for a cupboard; a porch, *c*; a back-room, *d*, in which there might be a boiler and an oven for baking, and also for heating water, and the flues in the floor; a place for the fuel, *e*; and a privy, *f*. The section, A B, shows that the kitchen floor, and that of the back kitchen and porch, are on a bed of stones. The bed-room floor is of boards laid on joists, and hollow beneath. The whole is surrounded by a platform, which may either be paved or laid with gravel; and along its outer margin, there may be a small parapet, with Gothic ornaments on it at the angles.

99. *Construction.* The walls may be built of stone or brick; and the roof covered with slates or flat tiles, projecting a few inches over the walls, so as to deliver the water which falls upon it into the gutter. The chimney tops are round, terminating with small capitals. The pediment over the entrance terminates in a small ornament or pinnacle, formed of oak (fig. 78, on a scale of half an inch to a foot), characteristic of old English cottages in districts abounding in timber.

78



100. *General Estimate.* Cubic contents, 7,430 feet, at 6*d.* per foot, £185 : 15*s.*; at 4*d.*, £123 : 18*s.*; and at 3*d.*, £92 : 17*s.*

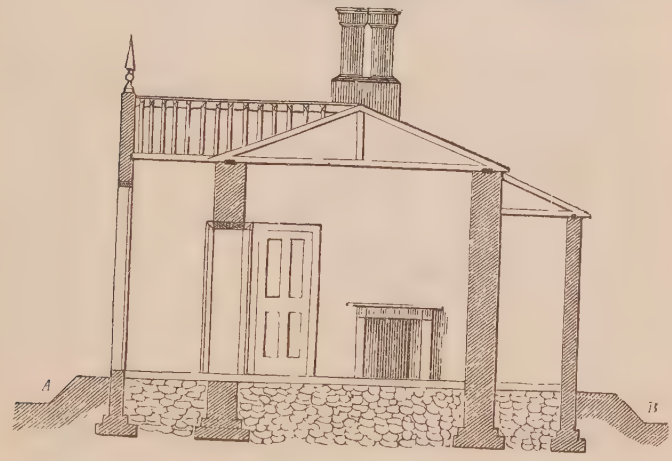
101. *Expression.* From the pointed top of the entrance-door, from the ornament on the summit of the pediment over it, and from the cylindrical chimney tops, it is evident that something more is intended than mere expression of the subject. Yet there is no great unity of style, for the tops of the windows are square, and there is nothing out of the usual course in the appearance of the roof. All that can be said of this elevation is, that it is pleasing and picturesque; that is, very well calculated to look well in a picture, though it is not in any very marked architectural style. The space between the tops of the windows and the eaves of the roof, is sufficient to admit of a veranda; and this, with a suitable parapet on the terrace, fig 79, would render this cottage a very ornamental object. Placed in a garden, and surrounded by low and round-headed fruit trees, such a building would produce a better effect than in a forest of pines or firs; as the pointed forms of those trees would not contrast so well with it, and they would overpower it by their size. In planting trees near dwellings of any kind, if it be desired to conceal the building, to diminish its importance in the landscape, and to render it an unhealthy abode for its occupants, then tall evergreen shrubs and large trees ought to be planted close to the edifice; but, if on the contrary, it be intended that the cottage should have some dignity of character, and that its occupants should keep their health, no tree, that under any circumstances grows higher than the building itself, should be planted within the distance of several yards of it.

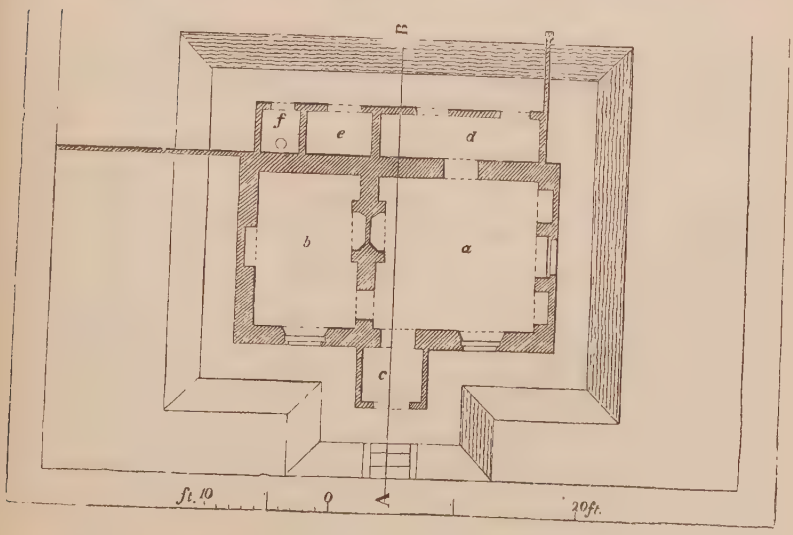
79

Design IX. — *A Dwelling in the Swiss style, for a Married Couple and Family; with a Cow-house and Pigsty.*

102. *Accommodation.* The rooms in this dwelling are of a good size, and there is a sufficient number of them for the comfort of the occupants. On the ground-floor, there is an entrance lobby, *a*, containing the staircase; a kitchen, *b*; a back-kitchen, or wash-house, *c*; a parlour, *d*; a light closet, *e*; a pantry, *f*; a coal closet, under the stairs, *g*; a cow-shed, *h*; a piggery, *i*; a wood-house, *k*, and a water-closet, or privy, *l*. The windows and doors of all this lower range are protected by a far projecting balcony, which, in point of comfort and effect, is equal if not superior to a veranda. The bed-room floor contains one best bed-chamber, *m*; a light closet, *n*; staircase, *o*; bed-room for boys, *p*; and for girls, *q*.

VIII.





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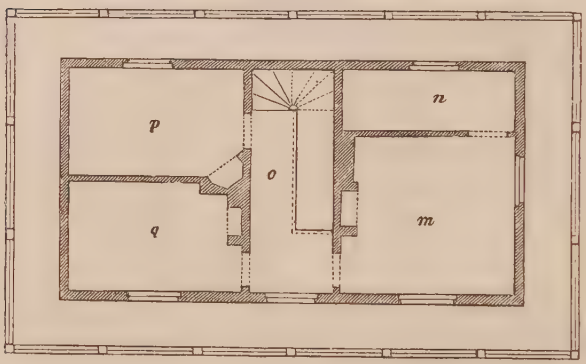
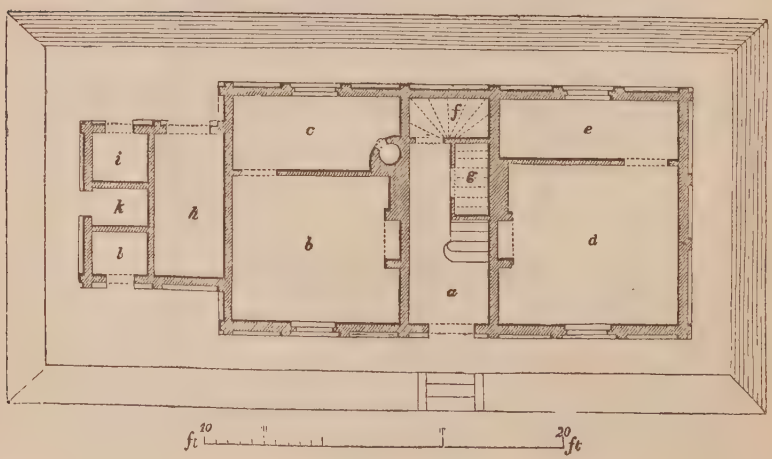
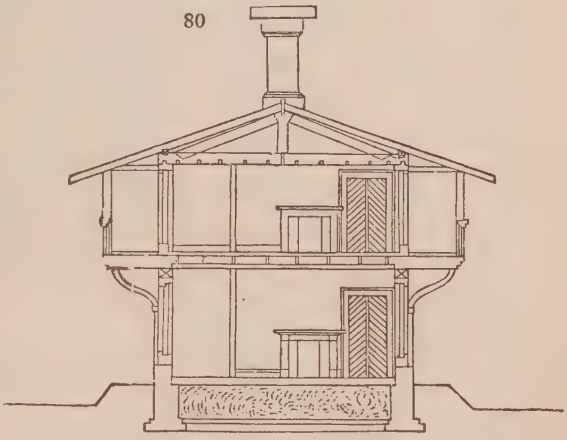




The balcony is entered from a glass door on the landing of the staircase; and in countries subject to snow and rain, is valuable for the protection which it gives to the windows and the boarded walls; as a place in which children and invalids may take exercise; to hang up corn seeds, herbs, tobacco, and various articles from the eaves; and more especially, to dry clothes on lines during wet weather.

103. *Construction.* The foundations, as high as about two feet above the platform, and the two interior walls containing the flues and the chimney stacks, are of brick or stone. All the rest of the building is of wood, being framed work, covered with boards, outside and in. In Switzerland, the native country of such buildings, these boards are seldom painted, though those on the outside are sometimes tarred, in order to preserve them from the weather. The roofs in that country are generally covered with shingles (wooden tiles), usually of larch or oak, as being the most durable, six or eight inches broad, and a foot or eighteen inches long; but in a country where slates or earthen tiles can be got, they are far preferable, not only on account of their durability, but because the shingles are very apt to be blown off by high winds. The balconies are supported by the continuation of the flooring joists, as appears by the cross section, fig. 80; under which are the further supports of brackets (fig. 81, to a scale of half an inch to a foot). The projecting part of the roof at the sides is

80



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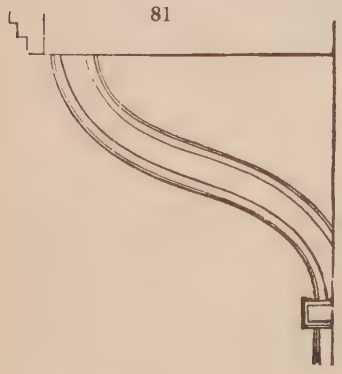

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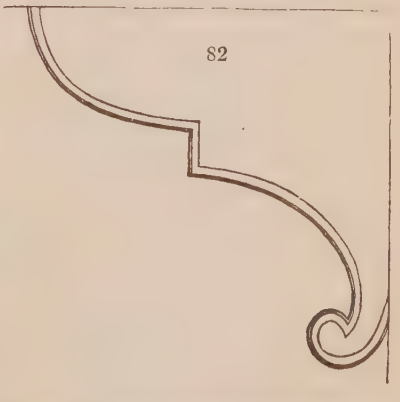

supported by the continuation of the rafters, as may be observed in fig. 80; and the ends are supported by solid brackets (fig. 82, to a scale of half an inch to a foot). The railing is generally simple, and characterized by perpendicular lines; the ornaments may be notched with the axe and chisel, fig. 83. The chimney has a coping of two broad flat stones or tiles, to exclude the rain; and the openings for the escape of the smoke are consequently lateral. The windows may be sashes hung in the English manner; or they may be hinged, opening inwards, according to the Italian and French taste, and as they most commonly are in Switzerland.

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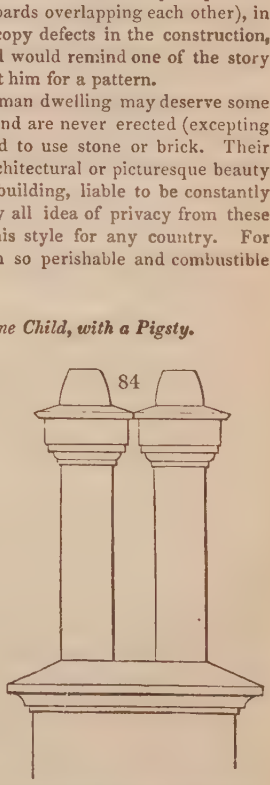
104. *General Estimate.* Cubic contents, 23,026 feet, at 6*d.* per foot, £575 : 13*s.*; at 4*d.* £383 : 15*s* : 4*d.*; and at 3*d.*, £287 : 16*s* : 6*d.*

105. *Expression.* This Design assumes a decided character or style, which no one, who has been in Switzerland, can doubt is in imitation of the timber-built dwellings of that country. As a picturesque object, it is most agreeable; more especially in its native situation on the side of a hill, where it is frequently accompanied by firs, or pines, or other spiry topped trees, which contrast well with the long horizontal line of the roof. It frequently happens that cottages of this sort are placed on the side of a steep slope, so that while the lower end is entirely above the surface the upper end is half sunk into it. In this case, the sloping line of the hill contrasts admirably, both with the horizontal and perpendicular lines of the building, and the appearance of stability is heightened by the one end being sunk or bedded into the hill. The balcony in this case, terminating on the surface, may be entered on the outside. The same cottage placed across the slope would appear much less stable, as well as less picturesque. In imitating the style of any particular country, the Architect ought to take care not to imitate peculiarities or defects. It is common, both in Switzerland and in Kinsigthal, in the Duchy of Baden, to see the roofs of dwellings of this sort, loaded with stones, with turves, with planks, or with roots of trees, to keep on the shingles, and even, in some cases, to prevent the roof itself from being blown off by the wind. A landscape painter in taking views in Switzerland or Baden, would, very properly, copy these circumstances, and a moral traveller would describe them; but for an Architect to introduce them as component parts of a Design in the Swiss style, would display a great want of discrimination, and would be, what Sir Joshua Reynolds, in his *Lectures on Painting*, calls, "imitating a peculiarity." It frequently happens, with such buildings in Switzerland, that being situated in narrow valleys, they are subject to partial inundations from sudden thaws; and also to have the rain thrown more violently against some parts of the building than against others, when the wind is in a particular direction. To guard against these incidents, barriers of boards are put up in the first case, and an exterior protection of weather boarding (boards overlapping each other), in the latter. For an Architect to imitate these, would be to copy defects in the construction, rendered necessary by an error in the choice of situation, and would remind one of the story of the Chinese tailor, who imitated the patches on a coat sent him for a pattern.

106. *The fitness* of a building of this construction for a human dwelling may deserve some consideration. It is certain that wooden buildings of any kind are never erected (excepting now and then as a matter of fancy), by those who can afford to use stone or brick. Their liability to accidents by fire, is an objection for which no architectural or picturesque beauty can ever compensate. The balcony also surrounding the building, liable to be constantly used, and commanding the bed-room windows, takes away all idea of privacy from these apartments. We, therefore, by no means, recommend this style for any country. For our own part, indeed, rather than bestow so much labour on so perishable and combustible a material as wood, we would prefer walls of earth.

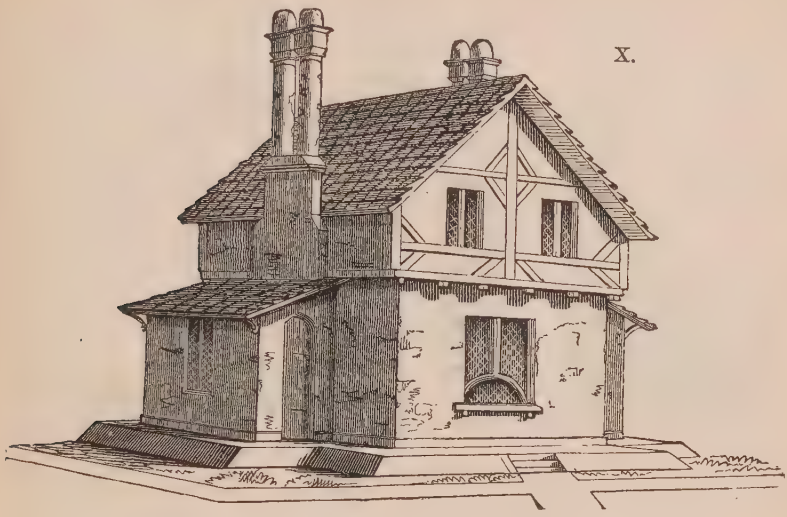
Design X.—*A Dwelling for a Married Couple and One Child, with a Pigsty.*

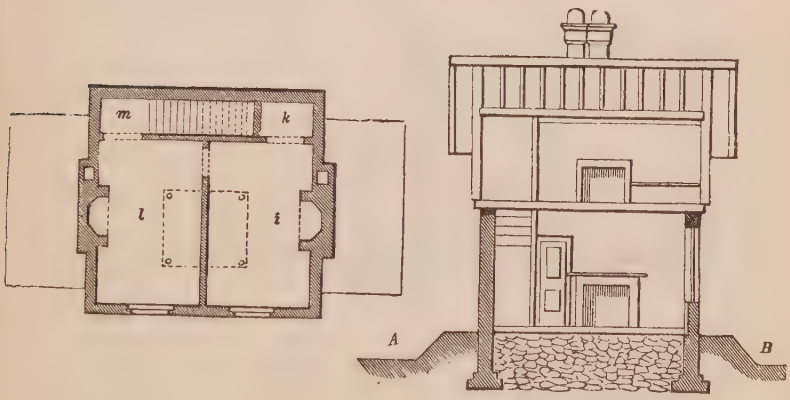


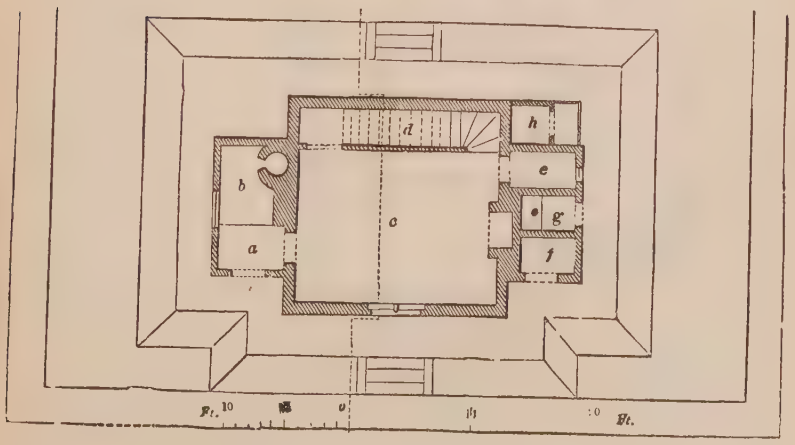
107. *Accommodation.* This is a dwelling of the lowest class, consisting of three rooms in two stories, and differing only from the commonest cottages in England by the completeness of its appendages, and the architecture of its exterior. It contains, on the ground-floor, an entrance porch or lobby, *a*; a wash-house, with a place for an oven to heat the kitchen-floor by a flue, *b*; a kitchen or living room, *c*; a large closet under the staircase, *d*; a pantry, *e*; fuel-house, *f*; water-closet or privy, *g*; and pigsty, *h*. The chamber-floor contains a bed-room, *i*; a clothes or lumber-closet, *k*; child's bed-room, *l*; and the staircase, *m*.

108. *Construction.* The walls, as high as the bed-room floor, may be built of stone or of brick, with a vacuity in the centre, as explained in describing Design I. Above, the walls may be of brick nogging; the principal timbers of which may be like those shown in the elevation. These walls should be plastered within and without. A much better plan of construction, however, is to carry up the brick walls to the roof; unless the object of the Architect be the imitation of an accident in

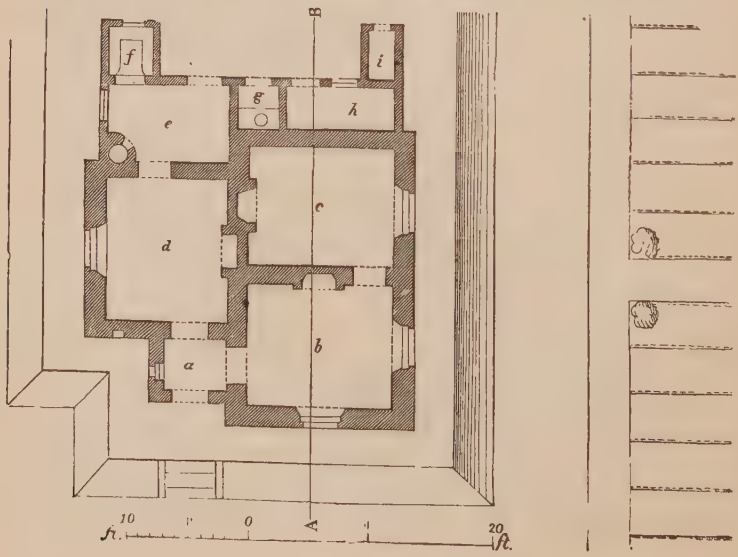
X.







XI.



a style, rather than its essentials; or economy, rather than strength, durability, and comfort. The roof may be covered with plain tiles; and some care may be bestowed on the chimneys, fig. 84, (scale, a quarter of an inch to a foot). These chimneys may be built of brick, and covered with cement; or be formed of cement only. The windows may have wooden mullions, fig. 85, and wooden casements; but we cannot recommend these casements being filled in with lattice-work; for that, like exterior walls of brick nogging, is an inferior mode of construction.

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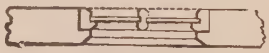

109. *Situation.* As this building admits of being viewed on every side, it is suitable for an open space. A few fruit trees are its appropriate accompaniments; and at a distance of a hundred yards, it may have as a back ground, a wood of oak, or other round-headed trees, to contrast with its upright and angular lines. It is not meant by this remark, however, either that such a wood should be planted on purpose; or that it is worth while to give up any point of utility or convenience, in order to place a cottage of this character near such a wood. The comfort of the occupant of the cottage should take precedence of every other object, either respecting it, or its accompaniments. It has been too much the practice, hitherto, for Architects and for their employers to set down cottages, more with a view to their effect in the landscape, than to any thing else whatever; but the habitation of a human being, however humble, ought not to be trifled with, either in respect to its accommodations, or its locality.

110. *Aspect.* From what we have already advanced on this subject in Chapter I. it will be understood, that in all practicable cases, we intend that the dwelling should be so placed as to admit of the sun shining on all its walls every fine day in the year, with the exception of a few weeks at the winter solstice. This, we need hardly repeat (were it not for the great importance of the subject), is to be done by imagining the general form of the ground-plan reduced to a square, and letting its diagonal be a north and south line. In most parts of Europe the door should face the south-east. When cottages are detached, and built either singly, or in pairs, and set down in a garden, the adherence to this rule of position, with respect to the sun, will add to the picturesque beauty of a village; whatever may be the direction of the road, along the sides of which the houses and gardens are built and laid out. This fact must never be forgotten; and indeed it should be considered, like the introduction of the platform, as a law, which in building detached cottages, ought never to be violated. In building long lines of connected dwellings of this sort, this law cannot be applied; but if the lines be in the direction of south and north, the same advantages, in point of heat and dryness, are obtained as by the diagonal position of detached cottages; for the sun will shine throughout the year on the east and west sides of every dwelling; and the south and north sides being party-walls (walls of division between different houses), will be necessarily both dry and warm.

111. *General Estimate.* Cubic contents 9,528 feet, at 6*d.* per foot, £238 : 4*s.*; at 4*d.*, £158 : 16*s.*; and at 3*d.*, £119 : 2*s.*

112. *Expression.* This cottage is in what is called the old English manner, which is characterized by windows not much higher than they are broad, and divided perpendicularly by mullions (vertical divisions); by high, conspicuous, and sometimes ornamented stacks of chimneys; by steep roofs generally covered with plain tiles, projecting at the eaves, and sometimes also at the gable ends; and, finally, by more or less of Gothic forms or mouldings in its details. In this imitation of the old English cottage, an erroneous manner of arrangement is conspicuous in the stacks of chimneys, which ought not to have been in the outside walls; and the introduction into these outer walls of brick nogging, is an inferior

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mode of construction, undeserving of imitation. A peculiarity, which in respect to use is a great deformity, is introduced in the principal window, in the form of the head of a Gothic arch supporting the mullion. This Gothic arch crosses the window in such a manner as to intercept the most valuable portion of the light. Nevertheless, we have given this Design a place, from its being characteristic of the style which it affects to exhibit; but we shall afterwards give other Designs in the same style not liable to the same objections. It is also proper to remark, that in new countries, where building materials and labour are scarce and dear, this would be exactly the sort of cottage that would be most suitable for a dwelling in the English cottage style; and in temperate climates rather milder than Britain, such, for example, as many parts of Australia, there could be no objection to the chimneys being in the outside walls. Their effect there, rising boldly into the air, and contrasting with the sloping surface and horizontal line of the roof, is excellent. A low box hedge, with standards at the angles, cut into architectural shapes, would be in perfect harmony with this style of cottage, fig. 86.

Design XI.—*A Dwelling for a Man and his Wife, and One or Two Children, with a Cow-house and Pigsty.*

113. *Accommodation.* This hermitage-looking dwelling contains a porch, *a*; a work-room or parlour, *b*; a bed-room communicating with it, *c*; a kitchen, *d*; and an outer kitchen or wash-house, with an oven, *e*; communicating with a pantry and dairy, *f*. The wash-house has a back door, near which, in the lean-to, is a privy, *g*; a cow-house, *h*; and a place for wood, or for a pig, *i*. In the section the floors are shown as laid over a bed of stones, and a gravelled terrace surrounds the whole building, on a level six inches lower than the floors of the rooms. In the bed of stones may be a flue connected with the oven placed in the angle of the back kitchen, *e*, as before described.

114. *Construction.* The walls are of stone, hewn at the coins (corners), and with the barge stones (a corruption of verge, and signifying the margin of any thing), also hewn. The roof is of a high pitch, in conformity with roofs in the Gothic style, and may be covered with pan (hollow) tiles, or plain tiles; it projects a few inches at the eaves, so as to deliver the water into a gutter. The windows and the door are surrounded by plain architraves; the principal windows have pointed tops, and are divided by mullions (fig. 87, *k*, to a scale of half an inch to the foot). The stack of chimneys, fig. 88, may either be executed in free-stone, or what in Britain will cost much less and yet be sufficiently durable, cement. The door is formed of bead and batten with exterior hinges, similar to those in Design VI. The gable ends are surmounted by crosses, which may either be formed of stone or cement, and if a description of that article, used in forming stone ornaments by Austin, of the New Road, London, be employed, there can be no doubt of their durability.

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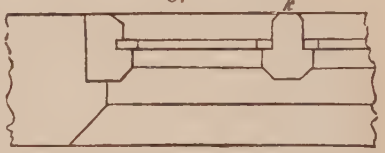

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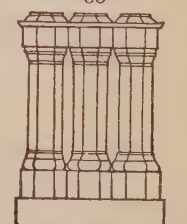

115. *Situation.* It is evident that a building of this sort is erected chiefly with a view to its ornamental effect, and, therefore, wherever it is placed, it ought not to be obscured by trees. It may be considered as a sort of hermitage, and, in this point of view, it should be placed in a solitary situation.

116. *General Estimate.* Cubic contents, 11,700 feet, at 6*d*., £292 : 10*s*.; at 4*d*., £195; and at 3*d*., £146 : 5*s*.

117. *Expression.* This being the first Design in which we have made a great departure from symmetry, that is, a correspondence of parts in the general form, it may be useful to offer a few remarks on the principle of irregularity in Architecture. It is evident that to introduce irregularity of form in buildings, is an architectural refinement of the present age; for, though in ancient buildings of every description, there is much more of irregularity than of symmetry, yet this irregularity has always been the result of accident; of additions made from time to time as they were required, or of subtractions or mutilations, according as certain parts might be done without, or as the ability to keep them in repair diminished. We find no ancient author on Architecture recommending irregularity; and from this we may conclude that no ancient Architect ever designed a building of an irregular form when he could help it. The first in Britain who decidedly recommended irregularity in buildings, was Uvedale Price, in the first edition of his admirable *Essays on the Picturesque*, published in 1794; and he was

soon followed by Mr. Knight, in his poem *The Landscape;* by Malton, in his works on Cottage Architecture, and subsequently by various others. Uvedale Price, who was a great admirer of Sir Joshua Reynolds, and of the works of the great painters of Italy, probably was strengthened in his ideas in favour of irregularity, by the following passage in one of Sir Joshua's *Discourses*:—"Architects may take advantage sometimes of the use of accidents to follow where they lead, and to improve them, rather than always trust to a regular plan. It often happens that additions have been made to houses at various times, for use or pleasure. As such buildings depart from regularity, they now and then acquire something of scenery by this accident, which I think might not unsuccessfully be adopted by an Architect in an original plan, if it does not too much interfere with convenience. Variety and intricacy is a beauty and excellence in every other of the arts which address the imagination; and why not in Architecture?" This passage is quoted by Knight, in his *Analytical Inquiry into the Principles of Taste*, as an authority for the praise which he also has bestowed on irregularity in Architecture. The practice at present needs no recommendation; being, as every one knows, followed in dwellings of every description, of extent, and of every kind of style. All that we are anxious to remark on the subject is, that irregularity can seldom or never be adopted in cottage dwellings where economy is a main object. On this subject we entirely agree with Laing, who, in the preface to his *Hints on Dwellings*, has the following remarks:

118. *The nearer the plan of a building approaches to a square*, says Laing, "the greater are its conveniences, and the cost proportionably less. A square, equal in superficial extent to a parallelogram, requires less external walling, and, consequently, less internal finishing. By compactness, convenience is produced, and expense is saved: when the apartments are scattered and lie wide from each other, with long passages between, much unpleasantness must be experienced; and a much larger expense must be incurred from covering a larger space of ground than is absolutely necessary." This objection, he adds, "may fairly be urged against some schemes, which I have lately seen by an ingenious artist, in which his anxiety to produce variety and want of uniformity, has led him to devise plans void of convenience and economy; how far void of taste, I will not say; yet, surely, uniformity is essential to beauty. I say this merely to oppose a taste which I consider false, and an economy which is profusion." (*Hints on Dwellings. Preface.*)

119. *Irregular Buildings* please their admirers partly with reference to their picturesque effect; and partly as being characteristic of some particular architectural style, as it is found to exist in ancient buildings. The castellated architecture of the present day is evidently more an imitative style, than one of picturesque beauty; and the irregular cottage style depends more on its picturesqueness, than on its being an imitation of any thing that has previously existed. Dugald Stewart, in one of his *Essays on the Beautiful*, has traced the progress of the taste for the several kinds of beauty from that of the rudest appearance of Design, to the greatest irregularities of form. He notices the pleasure which children very early manifest at the sight of regular forms and uniform arrangements. The same love of regular forms and of uniform arrangements, he says, "continues to influence powerfully in the maturity of reason and experience, the judgments we pronounce on all works of human art, whose regularity and uniformity do not interfere with purposes of utility. In recommending these forms and arrangements in the particular circumstances just mentioned, there is one principle which seems to me to have no inconsiderable influence, and which I shall take this opportunity of hinting at slightly, as I do not recollect to have seen it anywhere applied to questions of criticism. The principle I allude to is, that of the sufficient reason, of which so much use is made (and in my opinion sometimes very erroneously made), in the philosophy of Leibnitz. What is it that, in any thing which is merely ornamental, and which, at the same time, does not profess to be an imitation of nature, renders irregular forms displeasing? Is it not, at least in part, that irregularities are infinite; and that no circumstance can be imagined which should have decided the choice of the artist in favour of that particular figure which he has selected? The variety of regular figures (it must be acknowledged) is infinite also; but supposing the choice to be once fixed about the number of sides, no apparent caprice of the artist in adjusting their relative proportions, presents a disagreeable and inexplicable puzzle to the spectator. Is it not also owing, in part, to this, that in things merely ornamental, where no use, even the most trifling, is intended, the circular form possesses a superiority over all others?

120. *In a house*, which is commonly detached from all other buildings, and which stands on a perfectly level foundation, why are we offended when the door is not placed exactly in the middle; or when there is a window on one side of the door, and none corresponding to it on the other? Is it not that we are at a loss to conceive how the choice of the Architect could be thus determined, where all circumstances appear to be so exactly alike? This

disagreeable effect is, in a great measure, removed, the moment any purpose of utility is discovered, or even when the contiguity of other houses, or some peculiarity in the shape of ground, allows us to imagine, that some reasonable motive may have existed in the artist's mind, though we may be unable to trace it. An irregular castellated edifice, set down on a dead flat, conveys an idea of whim or of folly in the designer; and it would convey this idea still more strongly than it does, were it not that the imitation of something else, which we have previously seen with pleasure, makes the absurdity less revolting. The same, or yet greater irregularity, would not only satisfy, but delight the eye, in an ancient citadel, whose ground-work and elevations followed the rugged surface and fantastic projections of the rock on which it is built. The oblique position of a window in a house, would be intolerable; but utility, or rather necessity, reconciles the eye to it at once, in the cabin of a ship."—*Stewart's Philosophical Essays, p.* 240.

Design XII.—*A Dwelling of Two Stories for a Man and his Wife, with a Servant and Two or Three Children, with a Cow-house and Pigsty.*

121. *Accommodation.* This may be considered a comfortable dwelling for a gardener or bailiff in Britain; or for a small proprietor in America, or Australia. It contains, on the ground-floor, an entrance lobby, *a*; staircase, *b*; kitchen, *c*; parlour, *d*; tool-house or office for paying men, *e*; pantry and dairy, *f*; back kitchen, *g*; shed for wood and fuel, *h*; dusthole, *i*; privy, *k*; and cow-house, with hen-house over, *l*. The cow-house is connected with a court-yard, which contains a shed for hay and straw, piggeries, and dung-pit, with a manure well, connected with the privy. The platform, on three sides of this dwelling, forms a handsome walk, from which there is a door into the court-yard. The bed-room floor contains a best bed-room, *m*; a second bed-room, *n*; a third bed-room, *o*; and a stair, *p*.

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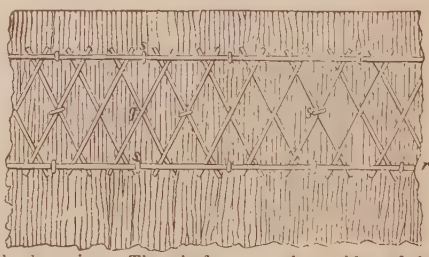

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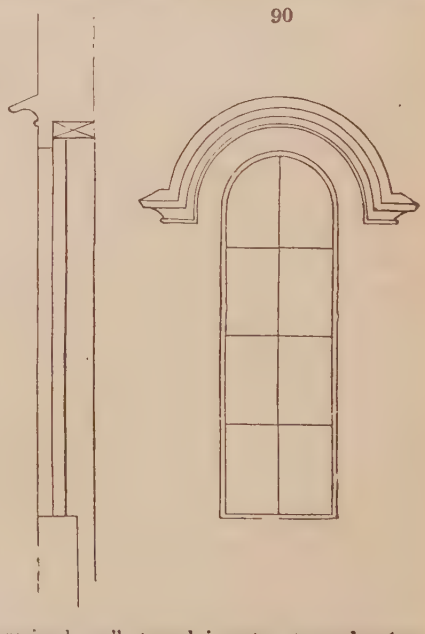
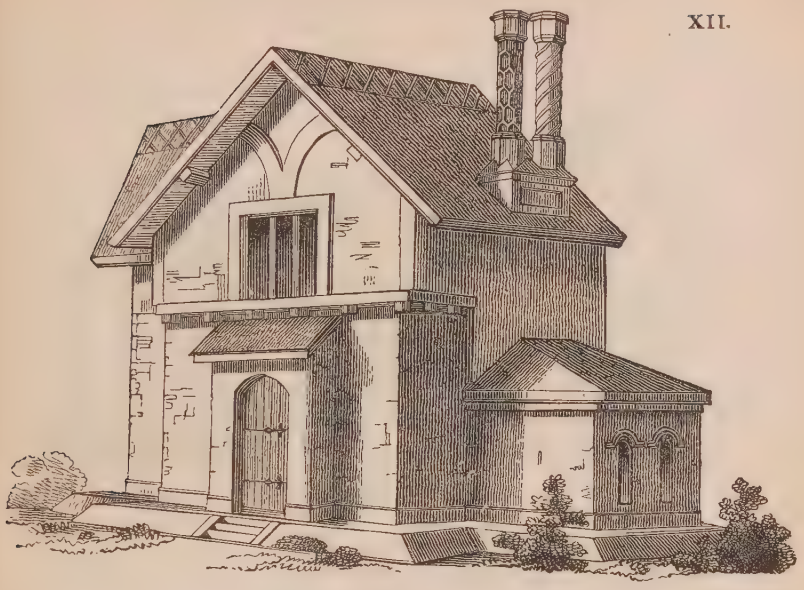
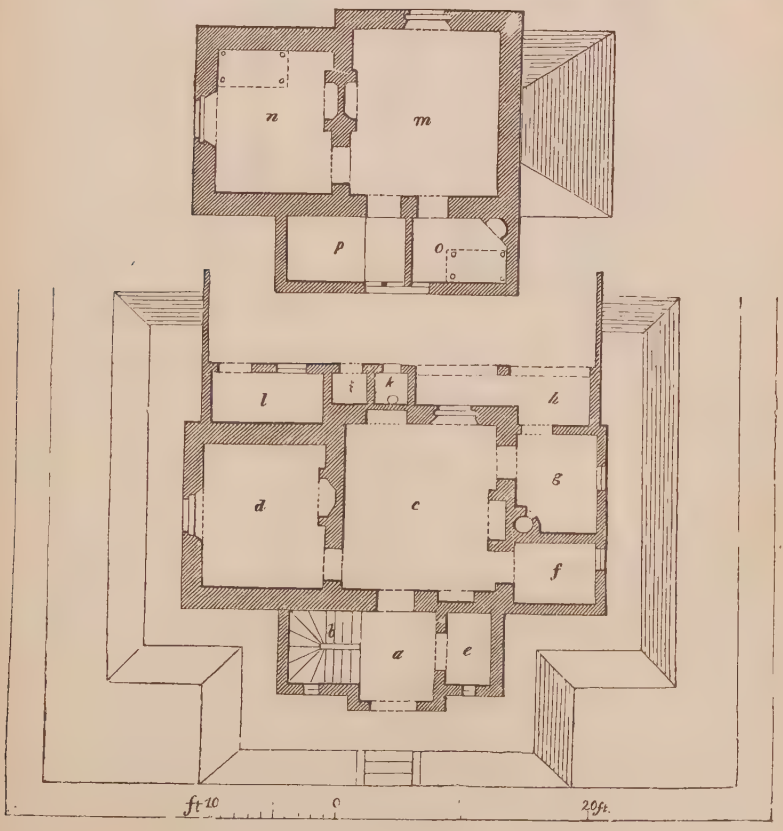


122. *Construction.* The walls may be of brick, or stone, or of brick nogging plastered externally, as shown in the elevation; care being taken, whatever material may be used, that the colour is neither a glaring red, nor a glaring white. The roof may be covered with reeds, or with combed wheat straw (straw from which the ears of grain have been cut or combed off, in consequence of which, the culms are unbruised by the flail). The intersecting lines shown at the ridge of the roof, and which may appear to many, not accustomed to see reed-covered buildings, as a mere ornament at the fancy of the thatcher, are formed by rods, generally of hazel, for the purpose of keeping down the layer of reeds, which are spread across the ridge tree of the roof. The intersecting rods, fig. 89, *q*, are kept in their places by the horizontal rods, *r r*; and these are fastened to the thatch, by staples, or spits, or broaches, *s*, which are nothing more than short pieces of rod, previously well steeped in water, to render them flexible, bent in the form of a staple hook, and stuck in the thatch or reeds. The forked piece of wood represented on the upper part of the gable end, should only be employed if the

XII.





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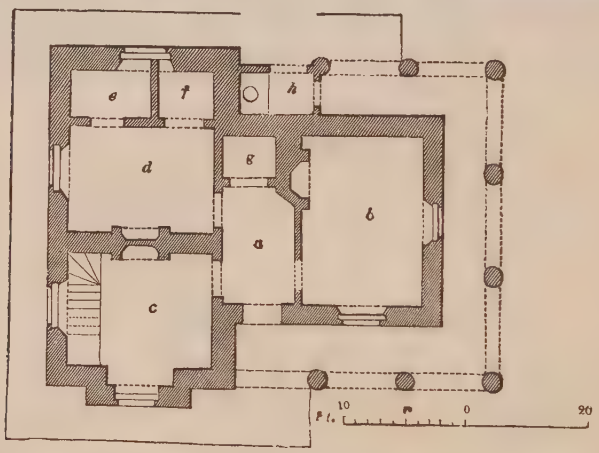

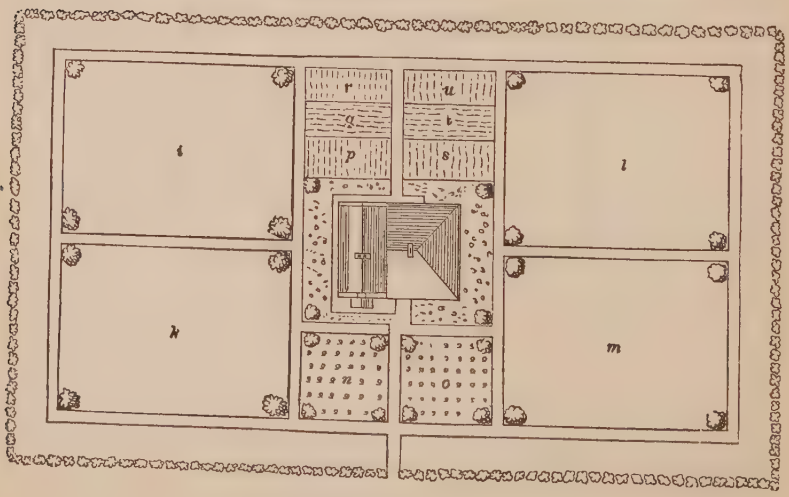

walls are of brick nogging. The entrance door is ledged; and the bed-room windows, which are broad rather than high, show two perpendicular and fixed bars or mullions; the casements being hinged to open inwards. The small windows in the lean-to are round-headed, with Gothic labels over them, fig. 90. The chimney shafts may be executed in cement, in a decorated style, (fig. 91, to a scale of the fourth of an inch to a foot), such as is sometimes found in the better description of old cottages and farm-houses.

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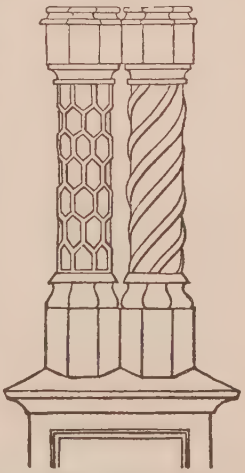


123. *Situation.* This dwelling being intended as an ornamental object, should not be crowded with trees; at the same time it is not calculated for a very exposed situation.

124. *General Estimate.* Cubic contents, 14,904 feet, at 6*d.* per foot, £372 : 12*s.*; at 4*d.*, £248 : 8*s.*; and at 3*d.*, £186 : 6*s.*

125. *Expression.* The style aimed at here is something of what is called the old English manner. Whatever interest may be excited by associations connected with this style, the specimen here represented, has evidently very little merit, taken by itself as a system of building. When a cottage is throughout in one system or style, all the parts of which it is composed, will seem to be the result of the mode of its construction; and to follow each other so obviously, that the eye and the mind are naturally led from one to the other throughout the whole superstructure. This is Wood's doctrine; and, tried by it, the Design before us will certainly be found wanting. There may be historical or accidental associations between the form of the door and that of the window over it; that is, it may have been usual to have such doors and windows in the same building in some old English cottages; but certainly the form of the one does not naturally arise out of the form of the other. Neither can it be said that the projection of part of the bed-room floor, as shown over the door-way, has anything to do with the mode of construction; on the contrary, to the eye of reason, it appears an inferior method; while, as a projection, it not only has not the merit of real utility, but the pretension which it might have had of forming a shelter to the entrance door, is destroyed, by that door having a small roof of its own; a superfluity which ought to have been avoided, since the walls of the porch evidently do not stand out beyond the line of the projection of the bed-room story. The small wing, or lean-to, shown below this last-mentioned window, seems to be in a different style from the rest of the building; both as regards the projection of its roof, and the labels to its two small windows. On the whole, though we acknowledge the ensemble of this Design to present a picturesque appearance, yet as a piece of Architecture, we consider it a deformity. Where the form of any one part of a building, says Wood, does not seem to depend upon that below it, but might as well be substituted by something different, the principle of arrangement is wanting. In looking at any building we endeavour to trace some simple principle of arrangement, the want of which can never be made up by good parts forced into service, or by superfluity of ornament. Profusion of parts, or of ornaments, without obvious connexion and propriety, produce confusion and absurdity. (*Letters of an Architect &c.* vol. i. p. 6). We have presented this Design for the purpose of showing how easy it is to captivate the eye in matters of this kind, without in any one point completely satisfying the judgment.

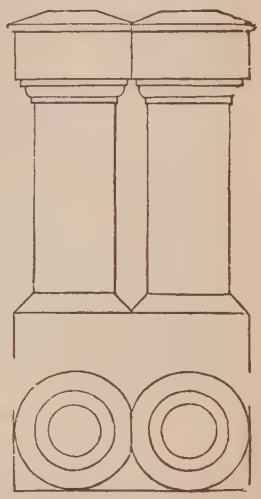
Design XIII.—*A Dwelling for a Man and his Wife, with Two or more Children.*

126. *Accommodation.* Here we have a colonnade which serves as a porch; a vestibule, *a*; a parlour, *b*; a kitchen, with a stair to two bed-rooms in the roof, *c*; a bed-room on the ground-floor, *d*; a pantry, *e*; two closets, *f*, *g*; and water-closet or pantry, *h*. The two bed-rooms over *c* and *d* may be lighted by dormer windows (windows made in the roof) and by the small opening seen in the upper part of the gable end.

127. *Construction.* The platform on which this dwelling is built, is sustained by masonry; which, on three sides, supports the columns of the veranda or colonnade. These columns may either be of stone, of brick stuccoed, or of timber; in either case, set on stone plinths, and with stone caps. The roof should be slated, with barge courses at the gable ends, terminating in pinnacles. The chimney tops (fig. 92, on a scale of three eighths of an inch to a foot), are plain, like the columns.

128. *The Garden*, containing about three fourths of an acre, is here shown surrounded by a hedge. This hedge might, in many cases, be formed of fruit-bearing shrubs, such as plums, apples, sloes, service or mountain ash, the berries of which afford an excellent spirit; or elders, the berries of which make a well-known wine. Whichever description of fruit-bearing plant is used, the branches must be pruned with a knife, and not clipped with shears; because clipping, by producing an exuberance of weak, young shoots, prevents the plants from forming blossom buds. If it should be desirable to have a very formidable fence, the hedge might consist of two rows; the inner one of fruit-bearing plants, and the outer one of hawthorns or hollies. There is scarcely any situation, either on hills or by the sea-shore, in which the elder will not thrive, and its fruit is always valuable. The same may be said of the sloe, and the mountain ash, and service, in respect to all inland situations. The mode of labouring and cropping the ground may be as follows: trench compartment *i* three spits deep, and plant with the cabbage tribe; manure and dig *k*, and plant with potatoes; trench *l* two spits deep, and sow with root crops, such as turnips, carrots, parsnips, onions, &c.; manure and dig *m*, and crop with peas, beans, and kidney beans. According to this rotation, in the second year, *i* will be manured and dug only, and will be under potatoes; *k* will be trenched two spits deep, and under root crops; *l* will be manured, dug, and under leguminous plants; and *m* will be trenched three spits deep, and under the cabbage tribe. Thus, a new stratum of soil will be brought up to the surface every other year: in the first year, what was the bottom becomes the top; in the second, the top is turned over; in the third, the middle becomes the top; and, in the fourth, this middle is turned over. Manure is applied every second year. This is enough to give a general idea of how a garden ought to be laboured, manured, and cropped; but more minute and accurate details will be found in our *Cottage Manual;* in *Denson's Peasant's Voice;* and in an excellent little work, by Mr. Charles Laurence, entitled *Practical Directions for Cottage Gardens, &c.* The smaller compartments may be cropped as follows: *n*, with gooseberries; *o*, with currants and raspberries; *p*, with strawberries; *q*, with asparagus; *r*, with sea-kale; *s*, with tart rhubarb; *t*, with Jerusalem artichokes; and *u*, with perennial, or what is called Good Henry spinach (Chenopodium Bonus Henricus). The border which surrounds the garden may be devoted to the smaller crops, such as salads, herbs, &c.; and to early crops, such as peas and potatoes. The space immediately surrounding the cottage should be ornamented with flowers and flowering shrubs. The trees at the corners of the compartments should be standard apples, pears, cherries, and plums.

92



129. *Situation.* It is evident that the main purpose of this building is effect; and if placed, as shown, on a raised architectural platform, in the centre of a garden not over planted, it cannot fail to look well from every point of view.

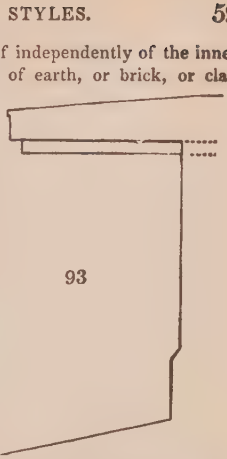
130. *General Estimate.* Cubic contents, 14,568 feet, at 6*d.*, £364 : 4*s.*; at 4*d.*, £242 : 16*s.*; and at 3*d.*, £182 : 2*s.*

131. *Expression.* It can hardly be said that this edifice resembles a cottage dwelling; and, at all events, it is certainly not one of the humble class. There is an obvious desire for display; and as this has produced a comfortable colonnade for the exercise of children, for hanging up Indian corn, tobacco, or seeds, and for drying clothes during rainy weather, it need not be much objected to. As far as respects style, the building is mixed; but, as the mixture is agreeable, a whole of some merit is produced.

Design XIV.—*A Dwelling for a Man and his Wife, with One Servant and a grown-up Son or Daughter.*

132. *Accommodation.* There is a kitchen, *a;* a scullery and sink, *b;* pantry, *c;* closet, *d;* two bed-rooms, *e* and *f;* a closet, *g;* a water-closet for women, *h;* and a water-closet for men, *i.* These accommodations are surrounded by an uninterrupted arcade, for the sake of effect, and for air, exercise, and drying clothes during inclement weather. An arcade necessarily throws a much greater shadow on the windows than square pillars, or round columns; but to compensate for this, it may be executed in brick-work, without the aid of lintels of stone or wood, or of cement.

133. *Construction.* The arcade, which may support the roof independently of the inner wall, should be of brick or stone. The inner walls may be of earth, or brick, or clay nogging, or of stud-work (frame-work), lathed and plastered. The pitch or rise of the roof is low, and the covering is supposed to be of slates of the largest size ; the sloping joints being covered with narrow strips of slate, in the manner known in Britain by the term Wyatt's Patent, to be afterwards described. The chimney stack has a far projecting cornice (fig 93, to a scale of half an inch to a foot).

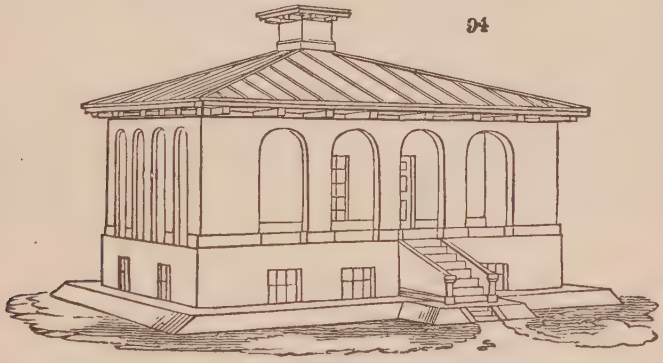


93

134. *Situation.* This dwelling is calculated for being placed on a platform supported by masonry, in the midst of a garden, on an elevated situation, because it will look well from every point of view.

135. *Garden.* Contents, two roods, thirty-five poles, and fifteen yards. The square in which the house stands is devoted to flowers and other ornamental plants. The compartment to the left of this square, to the perennial crops, such as asparagus, *k* ; sea-kale, *l* ; rampion, *m* ; tart rhubarb, *n*, *n* ; strawberries, *o*, *o* ; American cranberries, *p* ; Jerusalem artichokes, *q* ; and common artichokes, or perennial spinach, as may be preferred, *r*. The two squares to the right are devoted, *s*, to gooseberries, and *t*, to currants and raspberries. The two long squares, *u* and *v*, may be subjected to four years' rotation, as described in the preceding Design. There may be a well, or a sun dial, at *w*, and a small court of offices beyond the garden for other conveniences.

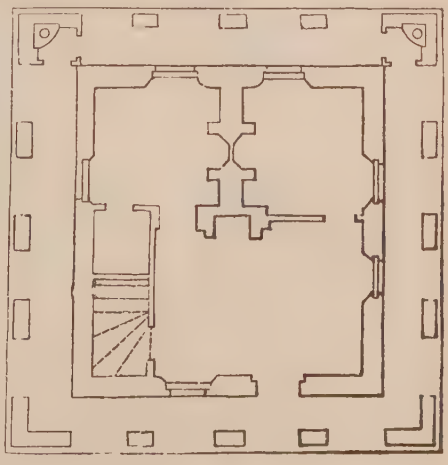
94



136. *General Estimate.* Cubic contents, 26,824 feet, at 6*d.* per foot, £670 : 12*s.* ; at 4*d.*, £447 : 1*s* : 4*d.* ; and at 3*d.*, £335 : 6*s.*

95

137. *Expression.* Small dwellings in this manner of architecture are generally considered as belonging to the Italian style. There can be no question of the excellence of the general effect; but we naturally ask how it happens, that in a building so studiously uniform, the entrance stairs should not have been placed in the centre of the front? If the answer be that there is not a central opening, the question occurs, why was not this provided in arranging the plan? Here, then, we have the Architect setting out on a principle, viz., that of uniformity, pursuing it through the main body of the building, and afterwards defeating all his labours by abandoning it in an important feature. If we consider this



building as a human habitation, there is also an obvious absurdity in expending so much for appearance, and yet paying so little attention to internal comfort, as to almost exclude that essential requisite to every dwelling, light. It is evident that all the rooms in this house must be very much darkened; not merely by the arcade, but by the great projection of the roof beyond it. No man, who exercises his reason for a moment, as to what he sees before him, can feel satisfaction on looking at a structure like this; at least with reference to such a climate as that of Britain. Perhaps in Italy, so much shade as this Design would produce may be desirable; and the want of light may not be so great an object in the present state of civilization in that country, since the people are not readers, and are far from being cleanly in either their persons or houses. But even for Italy, this Design is bad; because, in the warmest climates there must be times when more light is desirable than can be admitted into any of the apartments of this dwelling. Still the Design possesses a degree of simplicity and grandeur, and may afford useful hints for something better. The basement raised so as to include a sunk story, fig. 94, would be a great improvement, in point of convenience, and this would admit of lighting the rooms above from two sides instead of one, fig. 95; because, in that case, the back kitchen and store closet would be under ground. Another mode of improving this Design would be to retain the ground-floor in its present state, and to raise a bed-room story over it, roofing the arcade or veranda with glass, concealed by a parapet, and supporting the bed-room story on the inner walls. The removal of the projection of the roof would of itself admit more light; but when to this is added the light which will pass through the glass roof of the veranda, fig. 96, the house will be rendered habitable in any climate. In proportion as the height of the verandas and their openings are increased, the more light will be admitted to the windows beneath them; and if we imagine a veranda raised six or eight feet higher than the tops of the windows which it protects, the rooms would be as light as if there were no veranda at all. In all cases, therefore, of introducing arcades, colonnades, or verandas, before living rooms, they ought either not to project far from the walls, or to have their openings carried up higher than the architraves of the windows. This last arrangement, however, can very seldom be carried into

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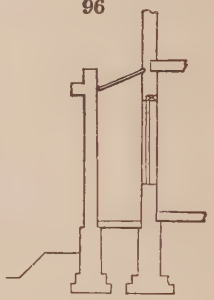
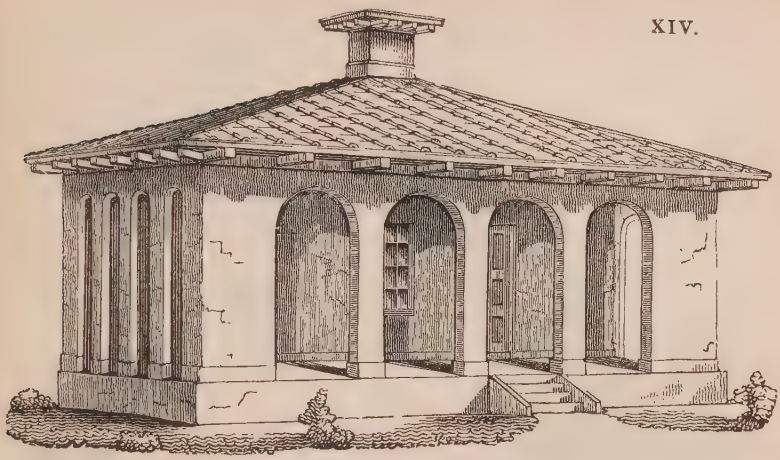
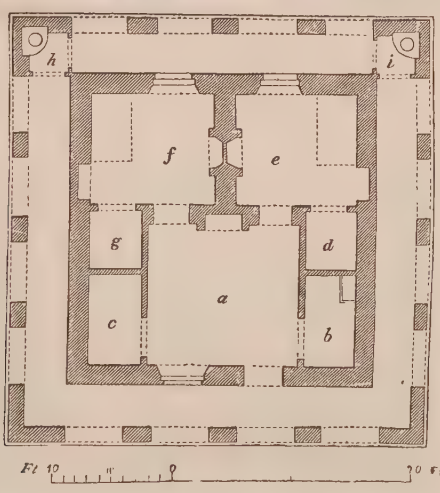


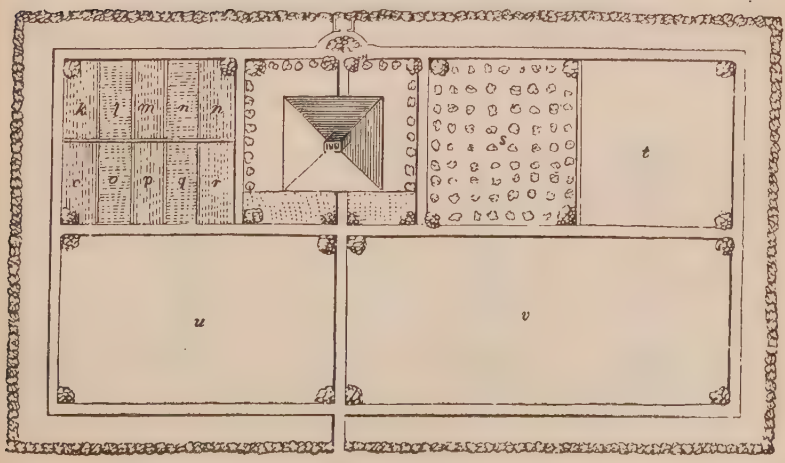
97

effect in buildings of more than one story, without violating some principle of utility or fitness. The arches in the Design before us being somewhat higher than the windows, a balcony might be formed over the veranda, which, by getting rid of the projection of the roof, would admit more light, and this, with a bed-room story added, would produce a good effect, fig. 97. There remains to be noticed another great defect in the expression of this

XIV.







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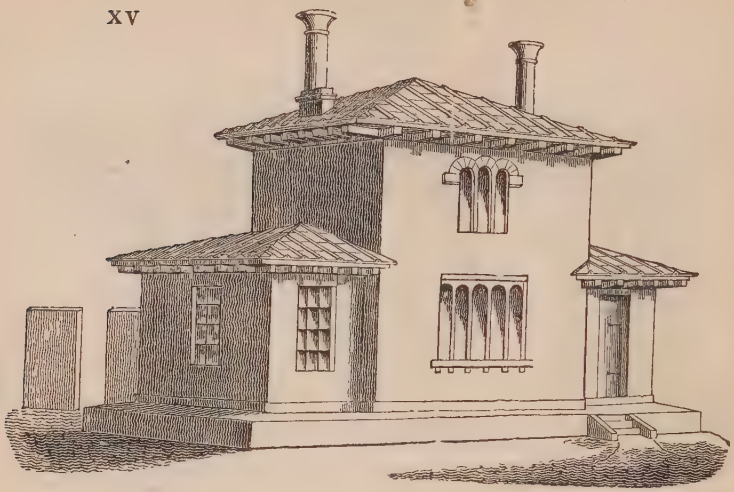

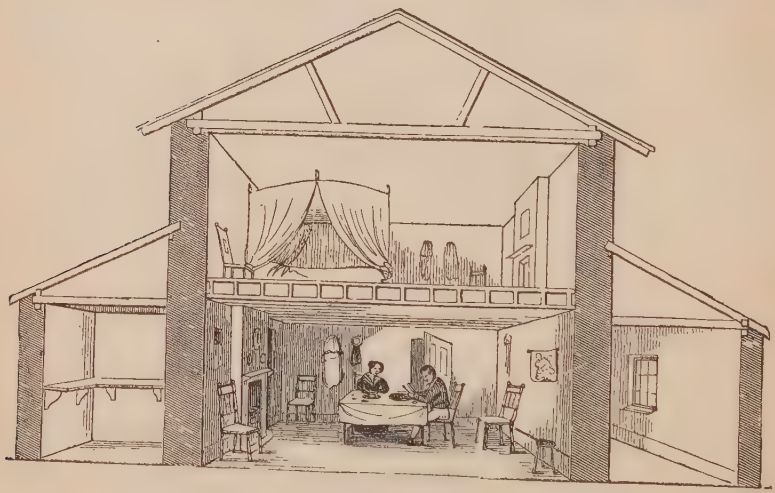

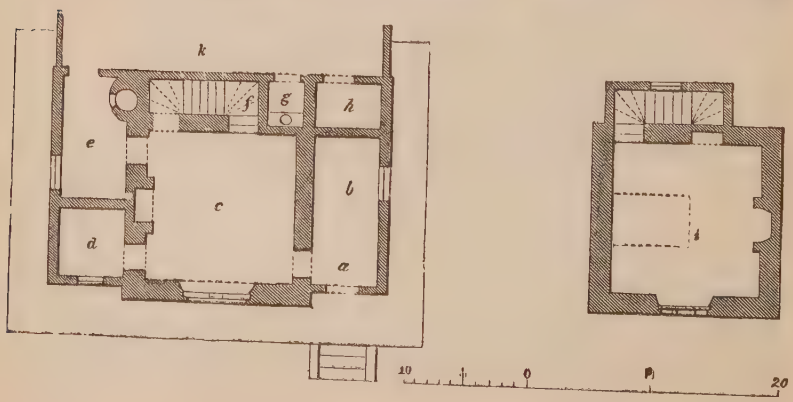

building as a human dwelling, and that is, the want of a porch. Independently of the addition which a porch would make to the expression of purpose, it would add to the actual comfort and propriety of the building; for, surely, there is a great inconsistency in forming so extensive a veranda, and yet leaving the steps of ascent to it not only uncovered, but without any architectural appendage to enhance their interest as a main entrance. To introduce a porch in the best manner in a building so entirely uniform, some alteration would be required in the position of the windows in the ground plan, so as to admit of preserving the character of symmetry, by having a porch in the centre of one side, fig. 98. Were this done, the width of the piers somewhat diminished, and something added to their height, the building would not only have a much better effect, but become more habitable, fig. 99. Edifices of this sort are much better calculated for ornamental purposes, such

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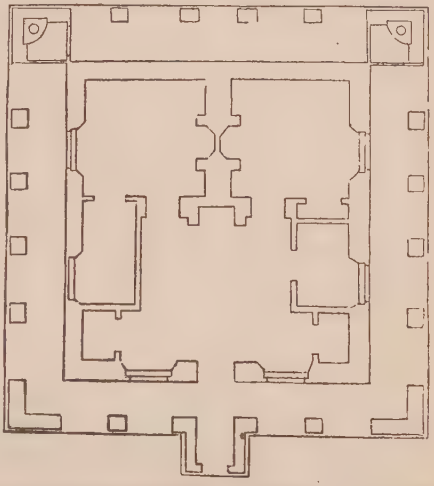

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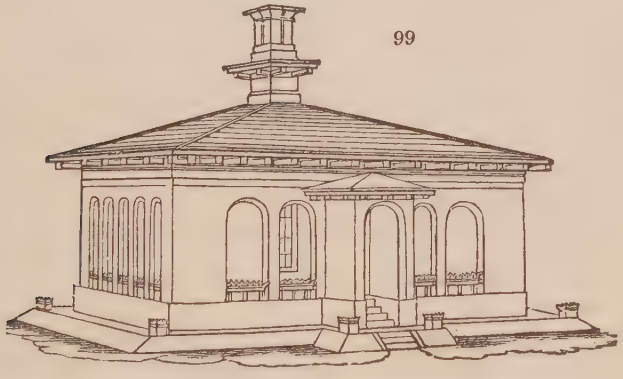


as a garden banqueting house; in pleasure-grounds, with a fruit and wine cellar under; or to be placed on a rock or small island, in a lake or river, as a place to fish from under cover.

100

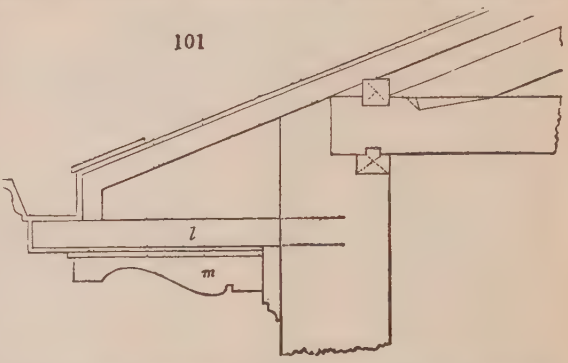
Design XV.—*A Dwelling for a Man and his Wife, without Children.*

138. *Accommodation.* This cottage, though very small, contains a good many comforts and conveniences. The entrance, *a*, is by a lean-to at one end, which serves as a porch, and at *b*, may also be used as a place for fuel. There is a good kitchen, *c*; a pantry, *d*; back kitchen, *e*, with an oven and a flue to heat the floor of the principal kitchen; a stair-case with a closet under, *f*; water-closet, *g*; and place for poultry, *h*. The upper story contains only one bed-room, *i*. There is a small yard behind, *k*, which may contain a cow-house and a pigsty, and which must include a manure well and dung-pit.

139. *Construction.* The walls are here represented of rough stone plastered, and the roof as covered with Grecian or Italian tiles. The terrace is of masonry, and the chimney tops (fig. 100, on a scale of three-eighths of an inch to a foot), are of brick and cement. The pro-

jection of the roof is considerable, and it is finished with a gutter, supported by short pieces let into the wall, fig. 101, *l*, and by cantilevers, *m*. The blocks supporting the sill of the kitchen window are of stone, and so is the sill. The mullions which divide the window are of wood, and the casements which fit into them are hinged so as to open inwards. The windows of the pantry and back kitchen are sash windows. The principal objection which we have to the construction of this cottage, is the placing the fireplaces in the outside walls. For cold climates, this is always with us, a very great objection; though, as this building is in the Italian style, it may be supposed to be adopted for the south of Europe, the most southern parts of North America, or for Australia. With a view to these countries, our objection falls to the ground; and in truth, we have raised it chiefly for the purpose of showing that some objections to buildings of this description, and indeed to all buildings, are relative. Of positive, or absolute objections, which have no relation to either country, climate, or situation, we see none in this Design. It is on a dry foundation, of sufficient strength in construction, and of sufficient durability in its materials. It is securely roofed; the rooms are sufficiently lofty, well lighted, and may be, if the occupant think fit, well ventilated.

101



140. *Situation.* This building having no windows behind, is calculated for being placed upon the side of a hill, and viewed from below. If surrounded by a good garden, and with no trees within a hundred yards of it higher than fruit trees, it can hardly fail to have a good effect. In general, trees which stand close to any building, more especially to one of small size, should either be decidedly larger or decidedly smaller than the building itself. The chief reason for this is, that objects of the same size, or apparently so, do not co-operate well in forming a whole; which always must consist of one principal or prominent part, and of two or more subordinate ones.

141. *General Estimate.* Cubic contents, 8,206 feet, at 6*d.*, £205 : 3*s.*; at 4*d.*, £136 : 15*s* : 4*d.*; and at 3*d.*, £102 : 11*s* : 6*d.*

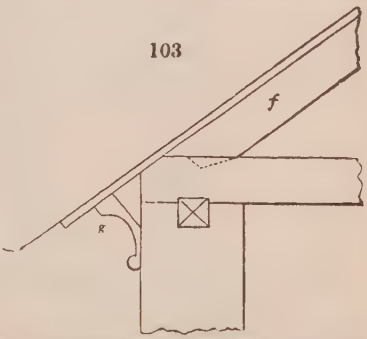
142. *Expression.* The style attempted is evidently Italian; but why a deviation was made in the wings from the Italian Gothic window, to the common English sash window, is not obvious. The fault is not a great one; because so far from interfering with utility, a superior article is introduced instead of an inferior one. But in respect to appearance, these windows certainly diminish the force of the style. Reduced to their proper form, and a parapet added to the terrace, fig. 102, this dwelling would produce a very good effect, and might serve for one of those which a recent writer in the Mechanic's Magazine, recommends to be substituted for mile-stones along the public roads of Great Britain. To the cottages so placed, he proposes to attach large gardens; and those, with the cottage, are to serve as models for neatness and order in their appearance and management to the agricultural labourers in the vicinity. The occupier of the cottage is to sit rent-free, on condition of keeping the sides and fences of one mile of road neat and orderly, and as free from weeds and all obstructions as the approach road in a gentleman's park a labour which might occupy him fifty or sixty days in the year. *Mech. Mag. Vol. XVI. p.* 410.

102

Design XVI.—*A Dwelling for a Man and his Wife without Children.*

143. *Accommodation.* This building contains a commodious kitchen, twelve feet by sixteen feet; and it has two windows, in order to admit of a tailor or shoemaker, with his apprentice, carrying on work at one window, while the woman's work is going on at the other. A large porch, *a*, which is lighted by a fanlight from the upper part of the doorway, forms both the entrance to the dwelling, and the passage of communication from the kitchen, *b*, to the bed-room, *c*. There is a pantry and store-closet, *d*, opening from the kitchen, and a light closet, *e*, partitioned off the bed-room. The privy, and other conveniences, are supposed to be placed at a short distance from the house, and to be concealed by bushes.

103



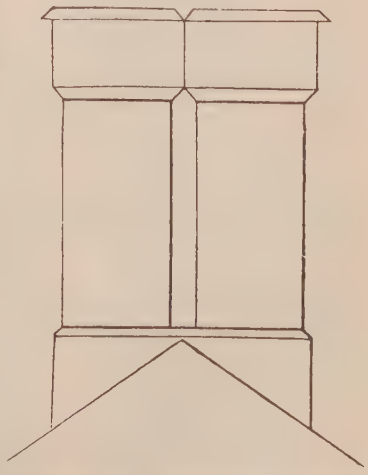
144. *Situation.* This building, having one side with only a small window in it, may be placed against a wood, and so that the entrance-door may front the south-east. The roof, being of thatch, indicates that it is not intended for a country subject to high winds.

145. *Construction.* The walls may be formed of stone or mud; or, in a country where bricks are abundant and cheap, they may be built hollow of brick-work (see § 25). The thatched roof will project over the walls, as shewn in the accompanying sketch, fig. 103; in which is shewn the rafter, *f*, placed at an angle of 30°, and also a wooden moulding, *g*, under the projecting thatch. The chimney-stack consists of two circular columns with plain heads, as in the annexed drawing (fig. 104, on a scale of half an inch to a foot).

146. *General Estimate.* Cubic contents, 10,328 feet, at 6*d.*, £258 : 4*s.*; at 4*d.*, £172 : 2*s* : 8*d.*; and at 3*d.*, £129 : 2*s.*

147. *The Garden* contains two roods and a half, and is divided into eight compartments, with a surrounding border; the boundary fence being a wall of mud, brick, or stone, against which may be planted fruit trees, or currants and gooseberries, according to the climate in which the design is executed. The compartment, *h*, is intended for a plantation of gooseberries, surrounded by a row of dwarf apples; *i*, is a plantation of currants and raspberries, surrounded by a row of pears, plums, and cherries; *k*, a grass plot; *l*, strawberries; *m*, perennial spinach; *n*, peas; *o*, beans; *p*, potatoes; *q*, the cabbage tribe; *r*, onions, turnips, carrots, and other surface and fusiform roots. In continuing the rotation, the compartments *n* and *o*, will, of course, be considered as one, and cropped, after (1) the leguminous vegetables, with (2) potatoes, (3) the cabbage tribe, and (4) roots. The borders round this garden may be devoted to small crops, such as salading, annual spinach, pot-herbs, tart rhubarb, which ought never to be omitted in the cottager's garden, a few plants of hops for their tops as asparagus, and their flowers for putting in beer, and, near the house, flowers and flowering shrubs.

104



148. *Remarks.* This Design may be considered as imperfect in point of accommodation, but we introduce it because there are many persons who may be able or willing to build such cottages for themselves or their dependents, who, from particular opinions or want of means, might be unable or unwilling to build a dwelling of a better description. If at any future time it were desired to enlarge this cottage, two rooms under a lean-to roof might easily be joined to the wall, *s*, *t*, which has but one small window, a communication being opened to such rooms by changing the destination of the kitchen closet. This will give the ground plan, fig. 105, which may be considered a tolerably commodious cottage; not only two additional bed-rooms, *u*, *v*, being obtained, but

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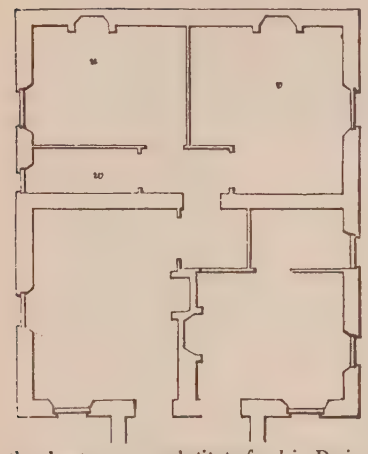

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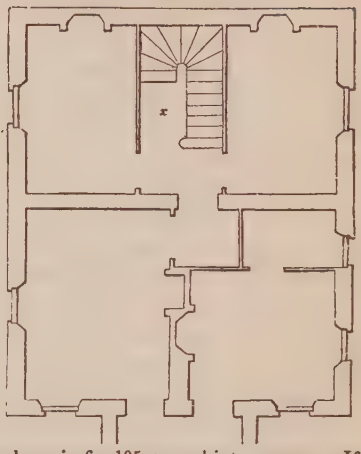

the closet, *w*, as a substitute for *d*, in Design XVI., here, in fig. 105, turned into a passage. If it were desirable to add four rooms instead of two, a passage and staircase might be formed between the two rooms, and two bed-chambers obtained in the floor above. This might be easily effected by turning round the partition wall of *w*, to a line with the door of that closet, and by removing the centre division wall between *u* and *v*, to a line with the door of the right hand bed-room, *v*; a space of seven feet wide would then be left in the middle for the staircase, fig. 106, *x*. Supposing the party who had made these alterations to have increased in prosperity, and to be desirous of one handsome dining-room in which to receive his friends, it might readily be attained by extending the building from the extremity of the staircase passage, as in fig. 107, in which a handsome room, *y*, is obtained; and over this it would be easy to form a corresponding drawing-room, or two additional bed-rooms. As it would be no longer desirable to pass through the kitchen to such apartments, a porch, *z*, might be added, so as to enter the dining-room and the staircase direct from the terrace or platform. The elevation, in the case of such alterations, may very properly be in a somewhat different style of building from the ori-

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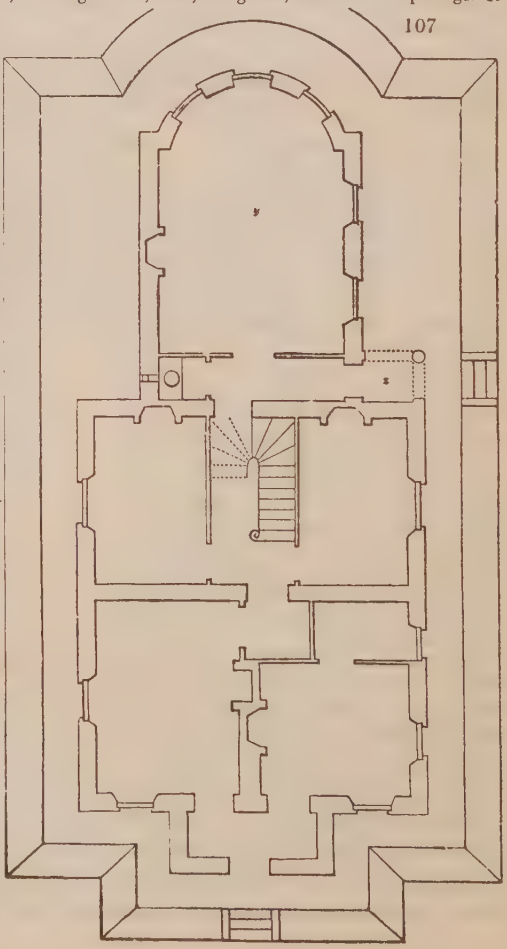

ginal cottage, because the builder may justly be supposed to have become possessed, not only of superior means, but of a higher degree of taste, or of consciousness of deficiency in taste, and consequently have called in professional assistance since his former erection. But

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whether he employs another, or proceeds on his own opinion, he will be justified by historical truth, as well as by the natural love of mankind for variety of character, in building two different additions, at different times, in different styles, or substyles of architecture. The elevations in this case will, in our opinion, be in perfect good taste, either as in fig. 108,

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which shows only the first addition; or as in fig. 109, which shows the dining-room added, but not a drawing-room; in lieu of this a flat roof is shown, over which an awning may be placed in the summer season, a practice particularly suitable for America and Australia. For the sake of variety, we have shown the centre building in a different style in fig. 109 to what it is in fig. 108. We have also shewn in fig. 109, three descriptions of terrace parapets, with three styles of ornamental vases; the vases for the original cottage may be stone pots, in shape not materially different from the common flower-pot; those for the first addition may be as in fig. 110, manufactured by Mr. Peake, of Tunstall, in Staffordshire, and sold at 15*s.* each; and those for the second addition may be a tazza (cup) vase, like fig. 111, manufactured by the same potter, at 18*s.* The progressive improvement of cottages in this manner, we consider as particularly suitable for the inhabitants of new and prosperous countries.

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149. *Expression.* The lofty proportions of the doors and windows, and the height of the

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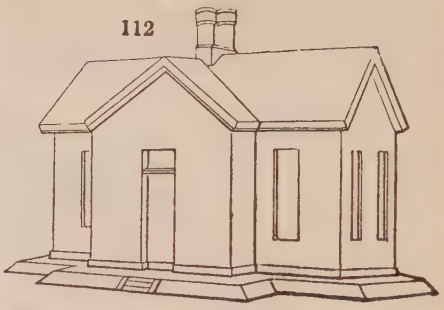

walls from the platform to the roof, give a certain expression of dignity to the exterior of this dwelling which every one must feel. But this expression is sadly counteracted by the mean, crouching appearance of the thatched roof, which, both as regards the material of which it is made, and the form in which it is disposed, is altogether unsuitable for the walls. In general, the truncated gable ends, such as are seen over the entrance-door, and at both ends of this cottage, convey the idea of imperfection of form, of restricted resources, and of meanness and tameness of character. If we suppose the pediment of the gable ends completed, even though the building continued to be covered with thatch, the effect (fig. 112) will be superior, and will leave much less to be wished for. But still the expression of a thatched cottage, as such cottages are generally seen and formed in Britain, is not complete; the walls continue to be too high, and the roof too low in the pitch, or not sufficiently steep on the sides; that is, the proportion between the walls and roof to which we are accustomed is violated. Lower the walls, and increase the surface of the roof, as in fig. 113, and the proportion is restored, the eye satisfied, and the expression of a thatched cottage comparatively complete. Let it not be supposed, however, that we prefer these proportions to those given in fig. 112 with a view to the principle of use; but for the sake of maintaining the beauty of style, we would, with windows of these proportions, introduce the Italian or Grecian roof of low pitch, similar to that of Design XV. Cottages with truncated gable ends, and with roofs, sometimes thatched and sometimes of slates, seem to be much approved of by many British architects; and many of them have not only been built, but several Designs in this manner have been published. We have no doubt they pleased at the time of their first introduction, from the novelty of the form, and they still please some; but we doubt much if the pleasure they communicate will stand the test of time. There is scarcely any architectural landscape painter who, if he were left to his free choice, would introduce Design XVI. into his composition in preference to fig. 113; at the same time we

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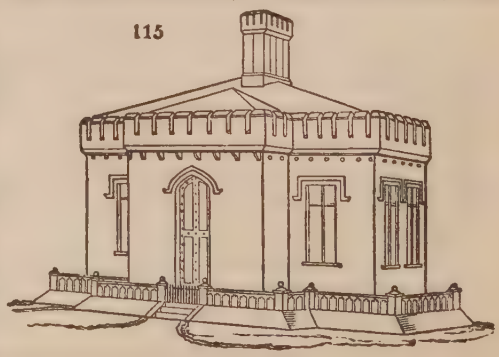
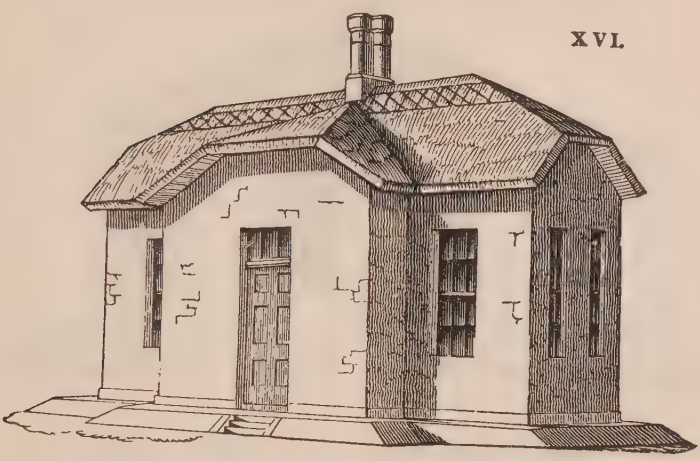
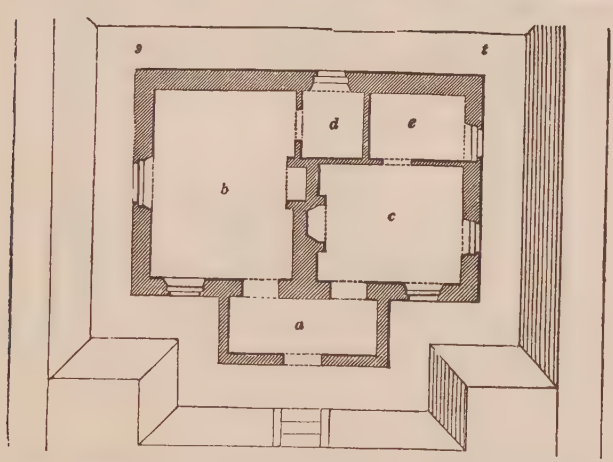
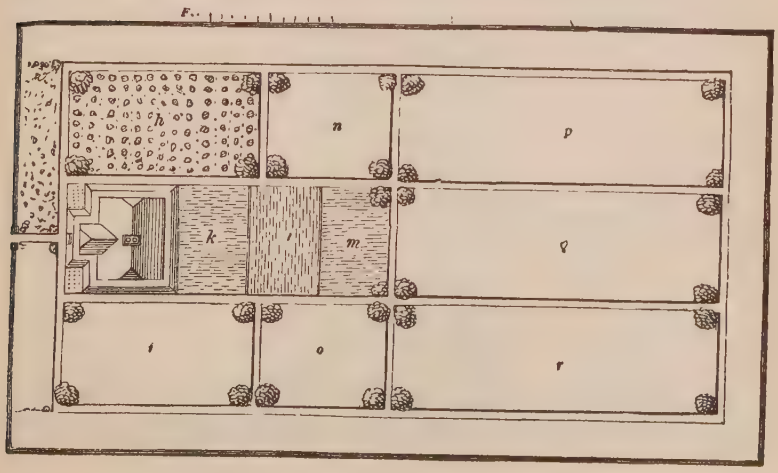


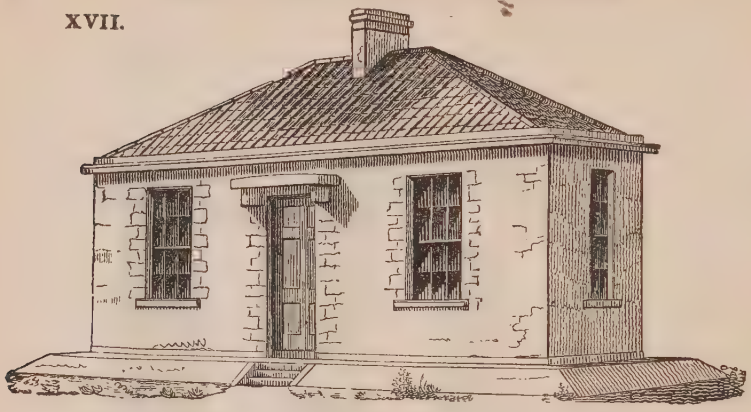
XVI.

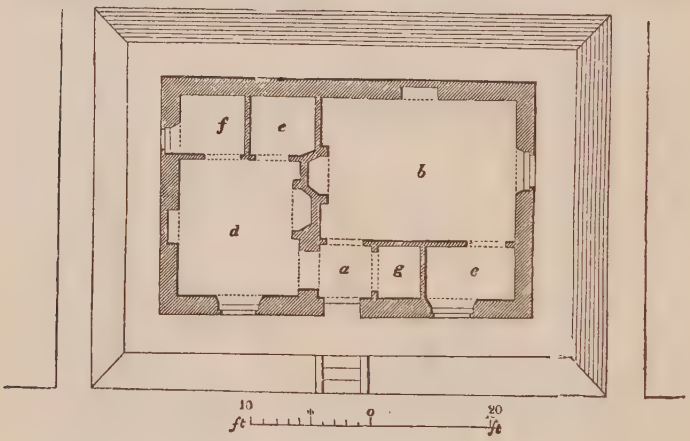


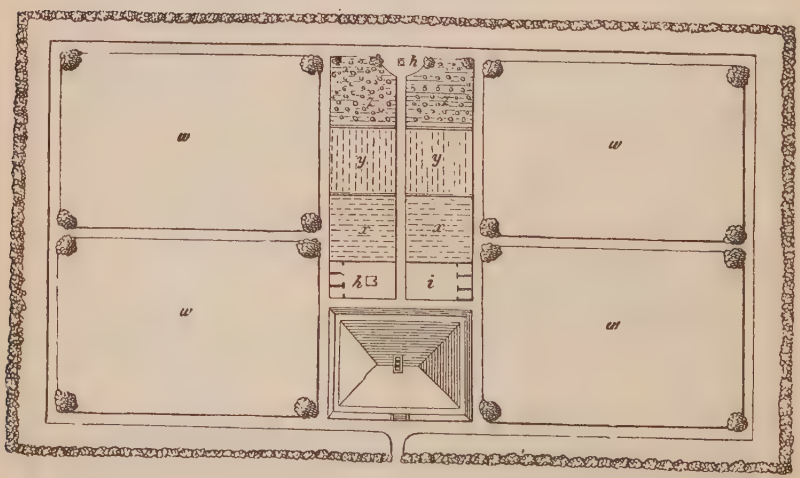




XVII.







allow that the truncated gable ends may occasionally be introduced for the sake of variety. The same ground plan, and general proportion of the different parts, including the door and windows, may be easily adapted to different elevations, according to the circumstances of country, climate, and locality, where it is to be built; and the wealth, good taste, or peculiar taste of the builder. In the suburbs of a country village it may be thought desirable, as a mark of distinction, to give it a highly architectural character, fig. 114; or on an elevated situation some might prefer finishing the walls with Gothic battlements with narrow embrasures, fig. 115, a taste which we have been rather surprised to learn is not uncommon in America. In the south of Europe, the southern parts of the American continent, and in Australia, the great luxury of a portico might lead to a continuation of one all round the structure, fig. 116; the columns being either rude trunks of trees, rude blocks of stone, or worked timber, with square stone plinths as bases, and plain capitals, fig. 117. Indeed a

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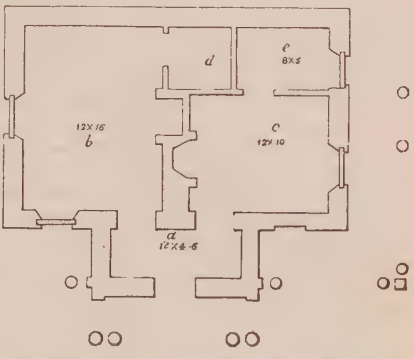

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colonnade or veranda, when it does not obstruct light or impede ventilation, is a great source of comfort and enjoyment in all countries; it excludes rain and cold in the north, and a burning sun in the south.

Design XVII. —*A Dwelling with Two Rooms and a Bed-closet, for a Man and his Wife, with an Apprentice or Servant.*

150. *Accommodation.* From the vestibule, *a*, a door leads to the kitchen, *b*, from which is partitioned off the room for the servant or apprentice, *c*, barely sufficient for a bed. The bed-room, *d*, has a dark closet, *e*, and a light one, *f*. There is a closet for fuel, *g*, and some use may be made of the roof, by having an opening in the ceiling, with a trap-door over the porch, and a suitable ladder as will hereafter be described. In the garden are two small yards, surrounded by fruit tree hedges; one of which, *h*, is for wood, poultry, pigs, a privy, and in the centre, a tank for liquid manure; and the other, *i*, is for a drying-ground, wash-house, place for tools, &c. At a short distance from the house, is shown the situation of the spring water well and pump, *k*, it being never desirable to have this near the dung-pit, or liquid manure tank. The pump in the garden may be considered, by some, as too far from the house, but that well is supposed to be of hard water, and principally for use in the garden. For washing, and other domestic purposes, soft water may be collected on the roof, and filtered as described under the Chapter of Model Cottages, Design I. § 31, or below, in § 151. There is a small building in the corner of the yard, *i*, which covers a tank for containing the filtered water, and it may be drawn to the house from that, or from any distance, by Siebe's pump, § 33, fig. 10. Various plans for constructing such a tank may be

given, but the following, by Waistell, is one of the most complete, either for a farm-house or for a substantial cottage.

151. *Waistell's Tank* is circular in the ground plan, with the sides built like a well. "The bottom should be in the form of a flat dome reversed, and the top also domical, with an opening left in the centre of sufficient size to admit a man to clean it out occasionally; the top of this opening should be a little above the surface of the ground, and should be covered with an oak flap, with several holes bored in it for ventilation; or the cover may be an iron grating, horizontal and a little elevated, or conical. These tanks may be constructed of various dimensions; the depth and width should be nearly equal; a hole should also be left for the service-pipe, or that which conveys the water into the tank, and also for the pipe for the pump, if the water be drawn out by that means. The water may be filtered previously to its entering the tank; the hole for the service-pipe ought, therefore, to be near the top, and on that side most convenient for the filtering chamber; this may be about four feet in diameter, and three feet deep; across this, about twelve inches from the side next the tank, as at fig. 118, *l*, a slate partition from the top to within about six inches from the bottom should be fixed; at the bottom of the box should be put clean coarse sand or pounded charcoal, about a foot in thickness. The pipe or opening from the filter to the reservoir should be of ample dimensions, and be made at about eighteen or twenty inches from the bottom, in the small division or space behind the slate. Above this opening, and in any part most convenient, as at *m*, in the large division of the filter, should be an opening or drain to carry off the water when the tank is full. This filter should also have a cover, that it may be cleaned out, and fresh sand, or some other purifier, put in as often as may be found requisite. Of course, the water, as it comes from the roof, is to be first conveyed into the large division of the filtering chamber, on the opposite side to the slate partition, as at fig. 119, *n*, and passing through the sand it rises in the small division purified, when it is fit to pass into the tank by the tube, *o*. If there are two or more of these filtering chambers, or if they are of greater depth, the water may be passed through the greater quantity of sand, &c. in them, and be still more purified. Both the tanks and the filtering chambers should be water tight; if constructed of brick, the inner course may be built in Roman cement, and afterwards the whole of the inside covered with a coat of about three quarters of an inch thick of the same material. Water from drains formed in the ground for the purpose of collecting it for domestic purposes, may be purified by passing it through a sand filter previously to its entering the tank or reservoir. Sponge and flannel may also be used as filters. In constructing tanks of the above description, care must be taken to have the earth closely filled around the brick-work, and to allow sufficient time for the work to get properly settled previously to admitting any great weight of water. Cisterns for water formed of blue slate, or Yorkshire paving stones, are much better than those made of wood, and lined with lead."—*Waistell's Designs for Farm Buildings.*

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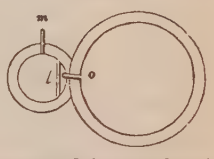

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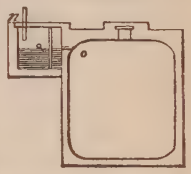

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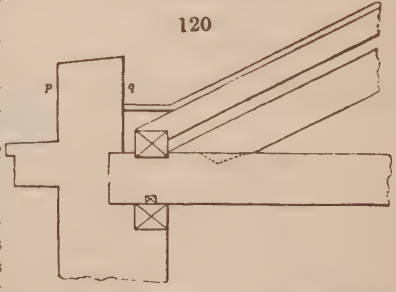

152. *The Construction of the Walls and Roof* of this dwelling is very similar to that of Design VII. The wall is carried up with a parapet or blocking course, fig. 120, *p*, behind which is the gutter, *q*. This gutter is usually covered with lead; but in countries like Russia, where cast-iron is abundant, it may be very conveniently formed of that metal, in connexion with the entire covering of the roof. A patent was some time ago taken out for this mode of covering roofs in England, by Carter, of Exeter, of which it may be useful here to give the substance.

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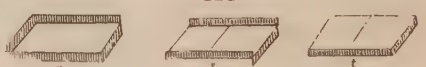

153. *Carter's Cast-iron Roofs* are formed of three descriptions of cast-iron plates, fig. 121, *r*, *s*, *t*. These forms answer every purpose for flat roofs which have not pavilion ends. One of them, *r*, is formed with three of its sides turned up and one turned down, and is called the roof plate. This plate is tapered narrower towards the lip by twice

the thickness of the plate. A second, *s*, is called the low ridge plate, and has two of its sides turned up, and the other two turned down. The third, *t*, is the high ridge, or cap plate, having all its sides turned down, and formed with an angle in the middle, so as to slope each way of the roof. This roof may be made very flat, so much so, that, for a house twenty feet wide, the height of the roof in the middle need not exceed two feet. No boarding is required, but the plates, fig. 122, *u*, may rest without either cement or nails, on the rafters, *v*. The appearance may be considered massive and handsome, fig. 123; and it is evident, from the manner in which the plates overlap each other, as shown in figs. 123 and 124, that there can be no risk of inconvenience from contraction or expansion. If a number of buildings were to be erected, it might become worth while to have plates cast on purpose for hips and angles, so as to complete pavilion roofs on the same principle. Probably, also, tiles, especially of the terro-metallic kind, manufactured from a stratum of clay almost peculiar to Staffordshire, might be formed of the same shapes as these plates, and be found strong enough, after burning, to serve as substitutes for cast-iron.

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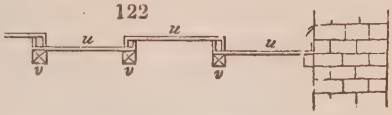

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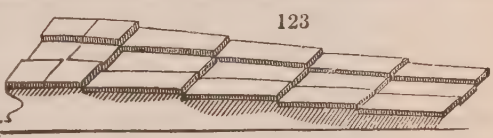

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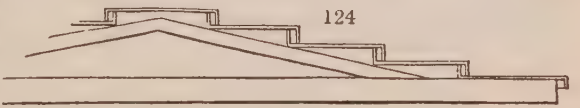

154. *The Garden* contains about two roods and a half, and is divided into four large compartments, *w*, *w*, *w*, *w*, for the usual four course rotation; there are several smaller compartments, viz., *x*, *x*, for grass plats surrounded by flowers; *y*, *y*, for strawberries; and *z*, *z*, for gooseberries, currants, and raspberries. The boundary fence is a hedge, which, in suitable climates, may be formed of figs; in more northern latitudes, of apples, quinces, or plums; and in cold, exposed situations, of sloes, elders, services, or mountain ash. The fruits of the sloe, and the berries of the elder, are valuable for wine and those of the service and mountain ash afford an excellent spirit. The three last named trees must never be clipped, otherwise they will produce but few blossoms. Whenever a cottager has the power of choosing the sort of hedge which shall surround his garden, he may, in all cases, if he chooses, render it productive of useful fruit; for every climate has its fruit shrubs, and its low edible fruit-bearing trees. It must always be recollected that the ground inside of the fence being under garden cultivation, and well manured, it would be a pity to let any part of this enriched soil be exhausted by barren trees or shrubs. Even where a powerful fence is required, by planting a double row of hedge plants, the outer one of thorns, and the inner one of fruit shrubs, the riches of the soil will not be altogether lost.

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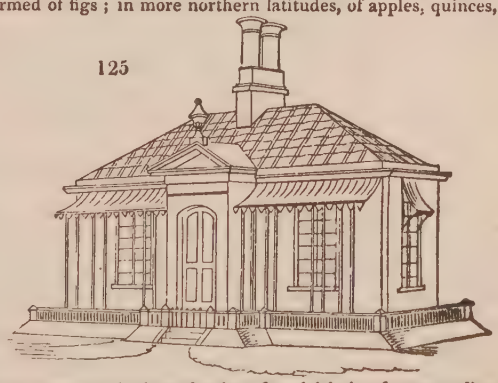

155. *General Estimate.* Cubic contents, 1,089 feet, at 6*d.* per foot, £272 : 5*s.*; at 4*d.*, £181 : 10*s.*; and at 3*d.*, £136 : 2*s* : 6*d.*

156. *Expression.* It must be confessed that this, though a substantial looking dwelling, which promises not to be without comfort within, has nothing elegant in its appearance. If it has any character of style, it is that of the Scotch stone cottage, and it might very fitly form a pair with Design VII. What can be done to render such a cottage elegant? A veranda might be added, more especially if it were roofed with glass, otherwise, it would darken the windows. The chimney top might also be enriched by ornamental chimney pots. The greatest improvement would be a substantial porch, fig. 125, which would add to the

interior accommodation and comfort. The veranda may be constructed of wrought iron sash

126

bars, of which fig. 126 is a section full size, cut to the proper length, the upper end let into the wall, and made secure by cement, and the lower ends notched into a cast-iron gutter, fig. 127. The veranda may have an apron in front, formed of cast-iron ornaments, fig. 128, screwed to the under side of the gutter, or to the upper part of the iron props which support it, fig. 129. No simpler or more durable form of veranda can well be constructed; its roof may be glazed with panes of crown glass, from five inches to ten inches wide, according as the country is more or less subject to violent hail storms. In those countries where there is no duty on glass, the bars may be placed a foot or more apart, and plate glass may be employed; the panes, in that case, being from a foot to eighteen inches in breadth. Where light is not an object, and blue slate abounds, it may be used in plates of any convenient size, stucco, or Roman cement, being employed instead of putty. Sheets of copper, zinc, tinned plates, or rolled iron, may be fixed in the same manner as the glass, or even tarpauling well painted, or oil-cloth, may also be fixed between the bars. The lightness of appearance may be increased, by bending the bars so as to give a concave form to the upper

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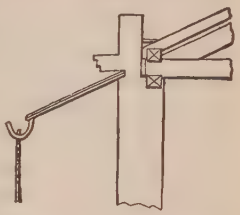

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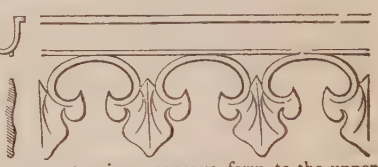

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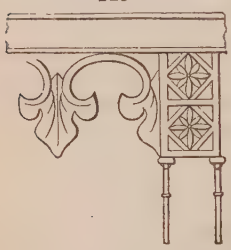

surface of the roof, fig. 130; concave surfaces, whether of ground or of roofs, reflecting more light, and therefore being always lighter, or more varied to the eye, than plain or convex ones. In this, and in various other cases of a like nature, where the width of the veranda is not more than four feet, it may be supported with cast-iron brackets of elegant architectural design, firmly built into the wall.

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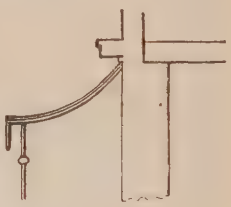
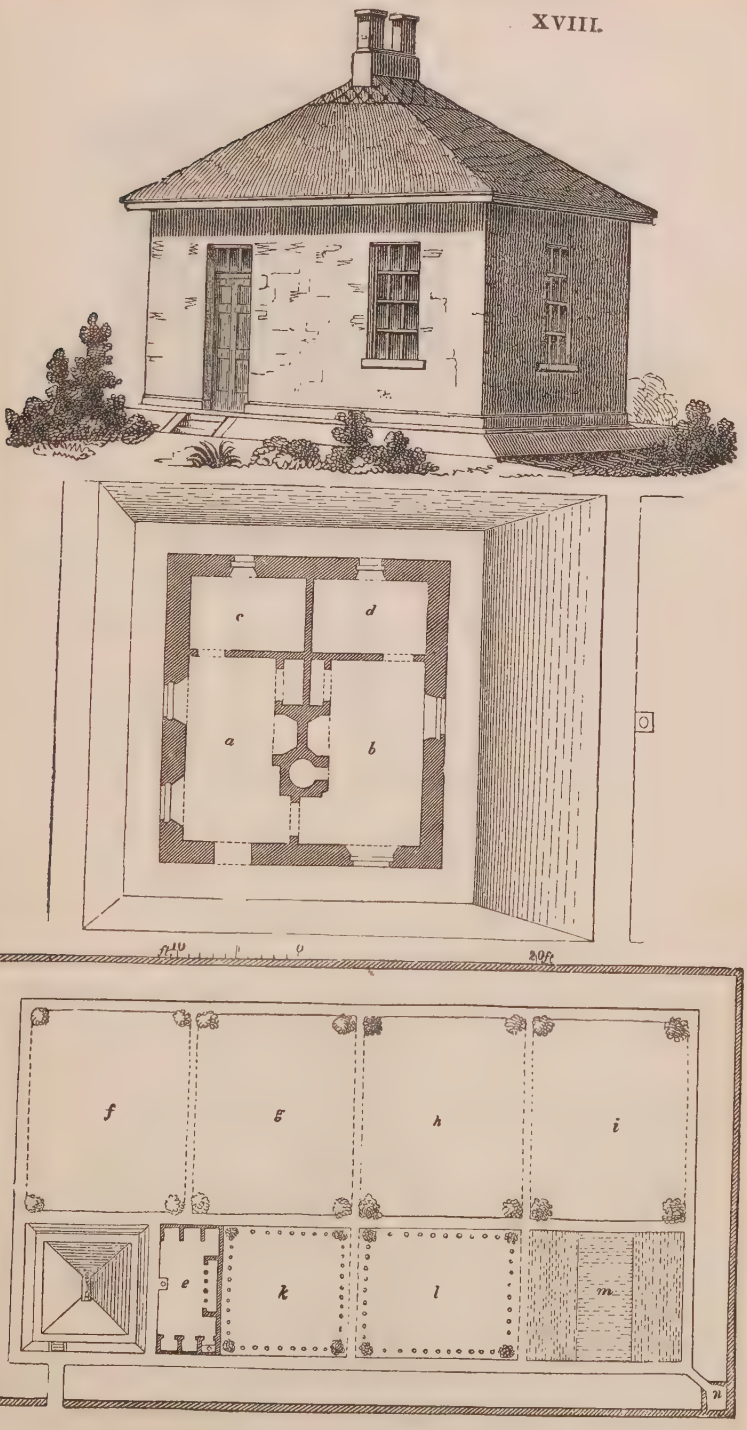


Design XVIII.—*A Dwelling for a Man and his Wife, without Children.*

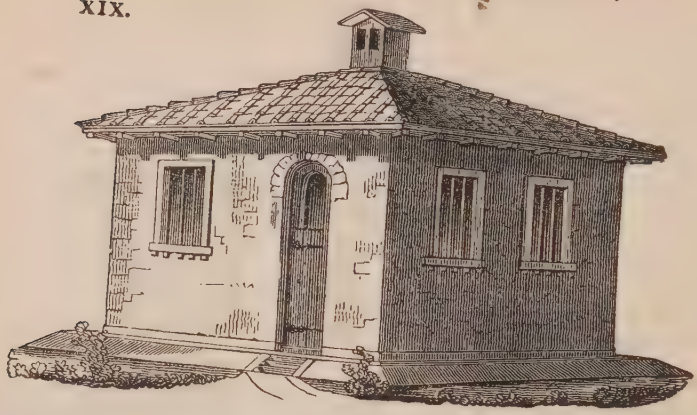
157. ***Accommodation.*** The man, in this case, is supposed to be a working mechanic, a shoemaker or weaver, who works at home in one room, *a*, while the business of the house is carried on by his wife in the other, *b*. There are two small rooms, *c* and *d*, one of which may be used as a bed-room, and the other as a store-room. In the kitchen, *b*, is an oven, which will contribute materially to warm the whole house, when baking is going forward during winter; and in summer, during the same operation, the apartment may be kept cool by opening both the windows. There is a good closet in the work-room, *a*, and also in the kitchen, *b*, so that, on the whole, there seems something like comfort in this dwelling, provided the man and his wife continue without children. In a small yard, which may be seen at *e*, in the plan exhibiting the garden, are contained a privy, pigsty, a place for fowls, a long narrow open shed for fuel, a manure tank and pump, and other conveniences.

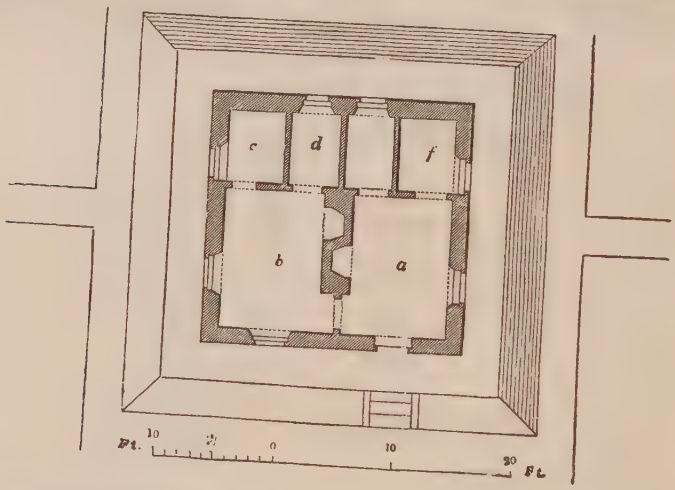
158. *Construction.* The great art in building an economical cottage, is to employ the kind of materials and labour which are cheapest in the given locality. In almost every part of the world the cheapest article of which the walls can be made, will be found to be the earth on which the cottage stands, and to make good walls from this earth is the principal art of the rustic or primitive builder. Soils, with reference to building, may be divided into two classes: clays, loams, and all such soils as can neither be called gravels nor sands; and sands and gravels. The former, whether they are stiff or free, rich or poor, mixed with stones, or free from stones, may be formed into walls in one of the three modes already mentioned, viz., in the pisé manner, by lumps moulded in boxes, and by compressed blocks. Sandy and gravelly soils may always be made into excellent walls, by forming a frame of boards, leaving a space between the boards of the intended thickness of the wall, and filling this with gravel mixed with lime mortar; or, if this cannot be got, with mortar made of clay and straw. In

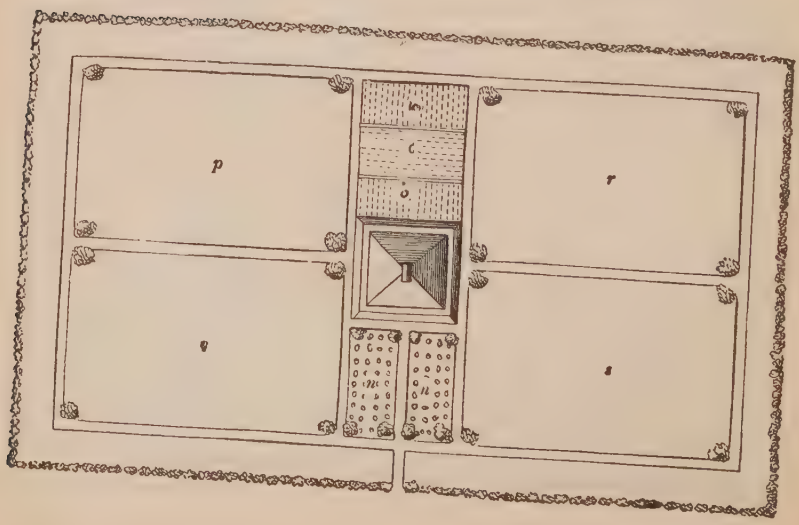
XVIII.



XIX.







all cases when walls, either of this class or of the former, are built, the foundations should be of stone or brick, and they should be carried up at least a foot above the upper surface of the platform. In the course of this work, we shall describe all the various methods of building earthern walls, and we shall here commence by giving one of the simplest modes of construction, from the work of a very excellent and highly estimable individual, Mr. Denson, of Waterbeach, Cambridgeshire, the author of *The Peasant's Voice*, who built his own cottage in the manner described below.

159. *Mode of building the Mud Walls of Cottages in Cambridgeshire.* After a labourer has dug a sufficient quantity of clay for his purpose, he works it up with straw; he is then provided with a frame eighteen inches in length, six deep, and from nine to twelve inches in diameter. In this frame he forms his lumps, in the same manner that a brickmaker forms his bricks; they are then packed up to dry by the weather; that done, they are fit for use, as a substitute for bricks. On laying the foundation of a cottage, a few layers of bricks are necessary, to prevent the lumps from contracting a damp from the earth. The fire-place is lined, and the oven is built with bricks. I have known cottagers, where they could get the grant of a piece of ground to build on for themselves, erect a cottage of this description at a cost of from £15 to £30. I examined one that was nearly completed, of a superior order; it contained two good lower rooms and a chamber, and was neatly thatched with straw. It is a warm, firm, and comfortable building; far superior to the one I live in; and my opinion is, that it will last for centuries. The lumps are laid with mortar, they are then plastered, and on the outside once rough cast, which is done by throwing a mixture of water, lime, and small stones against the walls before the plaster is dry, which gives them a very handsome appearance. The cottage I examined, cost £33, and took nearly one thousand lumps to complete it. I believe a labourer will make that number in two days: the roofs of cottages of this description are precisely the same as when built with bricks, or with a wooden frame. Cow-house sheds, garden walls, and partition fences, are formed with the same materials; but in all cases the tops are covered with straw, which the thatchers perform in a very neat manner. —*Denson's Peasant's Voice, p.* 31.

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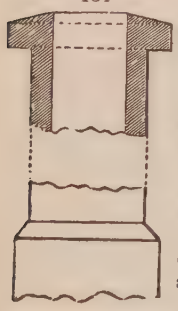

160. *The Roof* of this cottage is shown as if thatched with reeds or straw; it projects considerably on every side, and forms a truncated pyramid, terminating in the chimney-tops which are of stone, and of a very simple form, (fig. 131, to a scale of half an inch to a foot,) easily executed. Nearly the same form might be produced in well tempered clay, mixed with straw and gravel, and afterwards rough cast; but it is evident that it would not be so durable. When chimney-tops are formed of clay, a shape should be adopted which admits of covering them with a flag stone, or a large slate, or tiles, in the Swiss manner, fig. 132.

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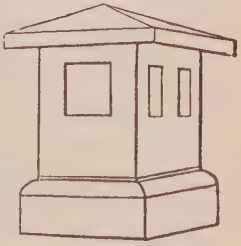

161. *Garden.* The extent is about three-fourths of an acre. There are four large compartments, *f*, *g*, *h*, *i*, calculated for a four-fold succession of crops; viz., potatoes, the leguminous tribe, the cabbage tribe, and turnips and other roots. Two small compartments, *k* and *l*, are devoted to currants, gooseberries, and raspberries; and *m*, to strawberries, asparagus, and sea-kale. The garden is surrounded by a wall, with a border for early and late crops, and for flowers. The rows of shrubs round the compartments, *k* and *l*, are chiefly ornamental, such as roses, honeysuckles, mezereons, Cydonia japónica, &c. The single fruit trees at the corners of the compartments are chiefly apples, with some pears, cherries, and plums. There is a small summer house at *n*, from which it may be supposed there is an extensive prospect.

162. *General Estimate.* Cubic contents, 11,362 feet, at 6*d.* per foot, £284 : 1*s.*; at 4*d.* £189 : 7*s* : 4*d.*; and at 3*d.*, £142 : 0*s* : 6*d.*

163. *Expression.* "I imagine," says Newton, in his preface to Vitruvius, "that every building should, by its appearance, express its destination and purpose; and that some character should prevail therein which is suitable to, and expressive of, the particular end it is to answer. To effect this, will require the exertion of the powers of the mind, the fire of genius, and the solidity of judgment; and without this, a composition is but a compilation of parts without meaning or end."—*Preface.* The dwelling now under consideration can hardly be considered as having any other expression than that of the subject. It is a substantial looking cottage dwelling, without any pretensions to either elegance or beauty.

164. *Alterations and Improvements.* The first and most obvious mode of ornamenting this cottage, is by surrounding it with a veranda, either glazed, or finished with sheet-iron or copper; and adding a light terrace parapet, and also chimney pots; for example, as in fig. 133. The terrace parapet may be a very simple wooden palisade, fig. 134; and both it and the veranda may be painted of a stone colour. In the suburbs of a town, we should not object to green; but in the country there is green enough; and the colour of stone is, by contrast, a relief to the eye. Another, and a very simple and economical mode of conferring ornament on such a cottage, is by disguising its

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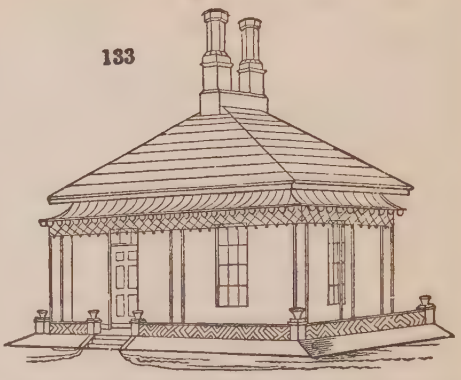

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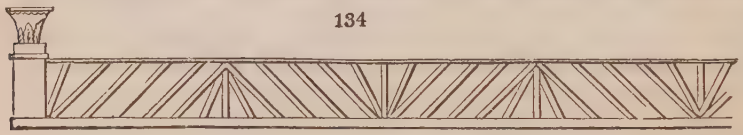

roof with a second roof, supported on a screen front; both roof and screen front being formed of light trellis work, for the purpose of being covered with plants, fig. 135. The construction of this trellis roof will easily be understood from the section, fig. 136, in which *o o* represent the walls of the house, and *p p* the roof, while *q q* and *r r* represent the trellis roof and trellis screen. It deserves to be remarked, that the screen being at the distance of only three feet from the walls, the trellis-work, even when covered with foliage, will throw very little shade on the windows, and therefore not materially darken the rooms. In warm countries, where it is desirable to sit, and even to dine, or receive visiters, under the veranda of a house, its distance from the walls should be double or treble what has hitherto been shown in these cottages. At whatever distance the trellis screen and roof may be placed, they ought to be covered with vegetation; and for the industrious cottager, we would recommend apples, pears, or vines, as the most profitable trees. We should even prefer elders for the roof, in climates where the apple would not ripen, rather than to cover the whole with merely ornamental plants, though these would do

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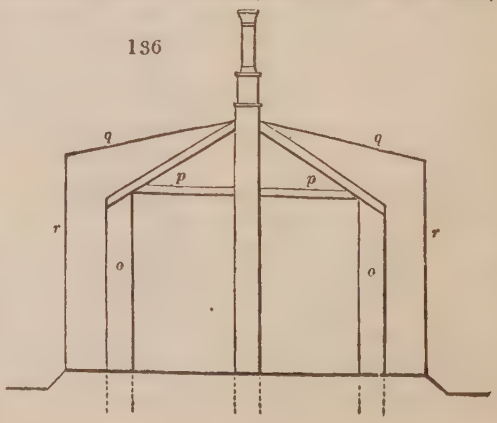

very well for the side screen. If heat were the great consideration, no plant could answer the purpose better than ivy; and it may be observed incidentally, that such a trellis-work

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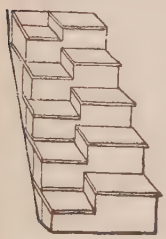

and screen would form a very handsome covering for any building in a garden or pleasure grounds, which it might be desirable to conceal, though a great objection to all such coverings is their harbouring insects, unless birds are so abundant as to keep them under. The greatest improvement, however, of which a cottage, such as Design XVIII. is susceptible, is by adding another story to it. This might be done in various ways; the cheapest would be by turning the two small closets into one economical staircase, of the kind shown in fig. 137. This description of staircase occupies exactly one half the space of a staircase on the ordinary plan. This may be easily conceived, when it is observed that every step rises twice the usual height. The space occupied by these two closets is four feet by three feet six inches, and supposing the tread or width of each step of the stair to be eight inches, and the rise eight inches, then the depth of the closet being eight feet, it will admit of carrying the stair eight feet high. After this, the stair may project into the kitchen till it gains the height of the surface of the bed-room floor. This height is exactly eleven feet six inches from the surface of the ground floor, none of our ceilings being lower than ten feet. If the projection of the top of the stair into the kitchen were an insuperable objection, then the bottom might either project two double steps into the bed-room below, the door shutting against the riser (perpendicular board) of the third step; or a trap stair, composed of the two lower steps, and made to fold up, might be resorted to. This practice is to be met with in France, and it is remarkable that the celebrated Jefferson, when making a tour in that country, was so struck with the contrivance, that he made a note of it in his journal, which has since been published in his

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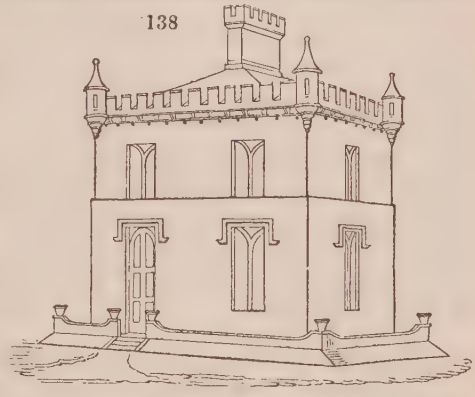

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Correspondence. The elevation of this cottage, in the event of a second story being added, will admit of adopting different styles of architecture, and a variety of the decorations or features belonging to each style. The castellated Gothic may be adopted, as in fig. 138; the monastic Gothic, as in fig. 139; the Indian Gothic, the Italian style, with a campanile-like watch tower, or the Elizabethan style, fig. 140. It may appear improbable to some, that a person purposing to build so small a dwelling, should think of applying any of these styles to it; but in particular situations in Britain, it is sometimes considered desirable to render such dwellings striking objects in a view; and in America, we are informed that the proprietors in easy circumstances are commencing not only to build good, comfortable cottages, but to display architectural style in them. Sometimes, also, the object is to create particular associations. It may appear singular to a resident in Britain, that a British emigrant in Van Diemen's Land should wish to build his dwelling in the form of an English church tower; but, duly considered, the feeling will be found to be quite natural. The associations which an object so characteristic of British scenery and civilization is calculated to raise up in the minds of Britons, resident in far distant, and, as yet, scarcely peopled countries, surrounded by primeval forests or wastes, can hardly be conceived by those who have never experienced them.

Design XIX.—*A Dwelling of Two Rooms for a Man and his Wife without Children.*

165. *Accommodation.* This dwelling contains what, in our opinion, ought to be the minimum of apartments for a man and his wife, without children, in any country. It is certain that, without this degree of accommodation in England, no country labourer considers himself at all comfortable; and in new countries, where the first settlers are obliged to put up with huts, or log houses, if they commence with one room, they never rest satisfied till they have obtained, at least, two. The room, *a*, in this design, is supposed to be used as a kitchen, and as the place for sitting and eating in; the bed-room is marked *b*; and from the kitchen are divided off a lumber closet, *f*, and a pantry, *e*. The bed-room has, in like manner, separated from it by partitions, two closets, *c* and *d*; one of which may be used as a store-room, and the other may serve as a place for clothes. The size of all these apartments is comparatively small; but they are all well lighted, and ten feet high from the floor to the ceiling. The privy, dung-pit, and manure tank, to this dwelling, are supposed to be placed at a short distance from it outside the garden; in our opinion, not the best arrangement, but in some particular situations unavoidable. The well for water is also supposed to be placed outside the garden, but in an opposite direction to, or at all events, at some distance from, the tank for manure.

166. *Situation.* This building is well calculated for being placed on the summit of a gentle elevation, in a situation where it will be seen from all sides. The reasons why it is suitable for this purpose, are, first and chiefly, the nearly cubical form of the building, which, from whatever point it is viewed, has a massive, substantial, and secure appearance; secondly, from the chimney being in the centre of the roof, thus giving an expression of symmetry, or of a whole, of which the chimney top is the finishing part; and thirdly, from the number of openings being the same on every side; for though these openings are irregular in size, yet they are regular in number, and mere regularity, though a minor beauty, has the advantage of being recognised and acknowledged by ordinary minds, while, at the same time, it is always more or less satisfactory to those even of the most refined taste. When we add to these particulars, the effect of the elevated platform on which the cottage stands, it being placed on the flattened summit of a knoll, and forming, as it were, an architectural plinth to this little cottage castle, it will not be denied that the result will be a somewhat dignified, though formal expression of purpose. One conspicuous fault

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in the elevation of this cottage is, that the chimney stack rises from the roof without any preparation, and is far from being sufficiently high. Were this feature properly altered, the effect would be very different, fig. 141.

167. *Aspect.* Much of the comfort enjoyed by the inhabitants of every dwelling will depend on the aspect of the windows. Where a house has only windows on one side, as we have before observed, (§ 24) the best aspect is the south-east, on account of the greater mildness of the wind from that quarter, the infrequency of south-easterly storms, and the cheerfulness of the morning sun. The least desirable aspect for a house having the windows and the door all on one side, is the north; because at such windows the sun will only enter during a few mornings and evenings before and after midsummer: the next worst aspect is, perhaps, the south-west; because the winds from that quarter are frequently boisterous, and are almost always accompanied with rain. If the entrance is unavoidably on the south-west side, then the door should be protected by a close porch, having its door opening to the south; if on the north-west or north-east, the entrance should be similarly protected by porches, having their doors opening to the west or east.

168. *Construction.* The walls are supposed to be of stone, and the roof to be covered with Tuscan or Grecian tiles (figs. 23 and 24, § 50). The windows are surrounded by what are commonly called facings, that is by architraves without mouldings; and the sills are supported by small blocks. The window frames may each be in three parts, opening inwards, with bold perpendicular astragals (from astragalus, the ankle bone; a bar with a round moulding resembling the end of that bone), and lighter horizontal ones. The chimney top may be covered by two pieces of flag-stone, or two large slates, each chimney flue having two holes on the sides of the stack for the smoke to escape. The water which falls on the roof, is collected by a gutter, formed in the manner shown by fig. 142, *g*, which gutter ought to be lined with lead; beneath this is the cantilever, *h*. The end of the wall plate is shown at *i*, on which the binders, *k*, of the rafters, *l*, rest, and to which they are fitted. The poleplate, *m*, is for the purpose of supporting the rafters.

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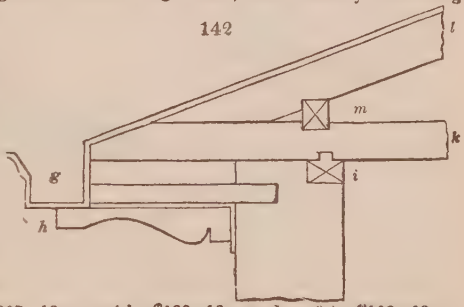

169. *General Estimate.* Cubic contents, 8,316 feet, at 6*d.* per foot, £207 : 18*s.*; at 4*d.*, £138 : 12*s.*; and at 3*d.*, £103 : 19*s.*

170. *The Garden* contains three roods. We have shown the house placed in the middle of a garden, and this garden is divided into seven compartments. The two small ones on the entrance front of the house, *n*, *n*, may be devoted to flowers, and herbs for seasoning, with a few rhubarb plants for tarts, and one or two hops. These compartments may be surrounded by a line of gooseberries, currants, raspberries, roses, and other useful and ornamental shrubs, three or four feet apart. The compartment, *o*, behind the house, is shown in three equal divisions, and is supposed to be cropped with strawberries, for the sake of selling the fruit. The remaining four compartments, *p*, *q*, *r*, *s*, two on each side of the house, will stand thus: — (1) potatoes; (2) peas, beans, kidney beans, and other leguminous crops; (3) the cabbage tribe; and (4) turnips, carrots, parsnips, onions, and other root crops. These crops may succeed each other in the above order in every compartment, and the rotation may thus go on for ever. The dung should be applied with the first and third crops. The surrounding hedge may be of plums or sloes, pruned, but not clipped, in order that the plants may produce fruit for sale, for tarts, or for wine. The fruit trees shown at the corners of the compartments may be chiefly apples, with one or two pears and cherries. The privy, dung-pit, and well, already noticed, are supposed to be exterior to the garden in the fuel plantation and therefore are not shown in the plan.

171. *Remarks.* On examining this dwelling, we find that though it is deficient in point of comfort, from having the privy at a distance, it is convenient in respect to in-door enjoyments, from having four light closets in addition to the two apartments which constitute the main part of the dwelling. It must not be forgotten, however, that the living-room, *a*, must also be used as a wash-house, and back kitchen; and that the room, *b*, having a bed in it, can never be considered, by an English labourer, as a comfortable sitting-room. Nothing, indeed, short of three rooms, viz., a kitchen, back kitchen, and bed-room, can be deemed sufficient for the comfort of even a labourer and his wife without children. We know a case in which a cobbler and his wife lived in such a cottage as that represented in the present Design, and

both these persons being under the usual size, they put a bed in the closet, *f*, and used the room, *b*, as the cobbler's work-room, for which, being lighted from two sides, it was very well adapted; but this is what is called, in England, making shift; a thing not to be recommended in any book written with a view to human improvement. We may, notwithstanding, state that a closet may be turned into a makeshift bed-room for persons of even the ordinary size, by projecting the foot of the bed, fig. 143, through a partition, *u*, into the next room, or closet, *v*, enclosing and covering the projection in such a manner as to give it the appearance of a chest of drawers or a press, and making the top serve as a dressing table, *w*. In the space below the bottom of the bed, a large drawer, *x*, for clothes or linen may be obtained, opening into the closet, *v*.

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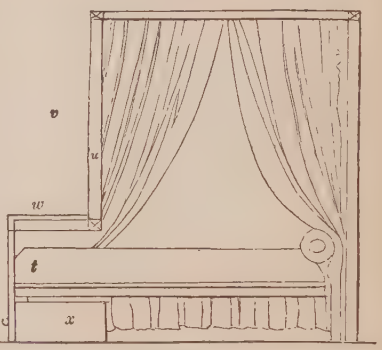

172. *Expression.* It is evident, from inspection, that something more is intended in the elevation of this cottage than mere expression of the subject. The blocks or dentils under the window sills, the projecting roof, and its tiles, the cover to the chimney top, the general form of the windows, and the arched head of the doorway, show something like an attempt at architectural style. What, then, is the style attempted? Those who have viewed the buildings of all the countries of Europe with an architectural eye, or those who have studied the cottage buildings in the pictures of the Italian landscape painters, will best be able to determine this question. All will agree that it seems to belong to the Italian style. This style, as it is called, though in reality it is only a substyle or manner, is founded on the Roman variety of Grecian architecture, with some forms, dispositions, and ornaments belonging to the castellated Gothic, but is by no means definite in its characteristics. In buildings of the humblest class, it may be described as characterised by flat and far projecting roofs, massive walls, and windows broad rather than deep, which are generally carried up close to the eaves, in order to be shaded, as much as possible, from the sun. In adapting the Italian style to England, this last characteristic is generally somewhat modified, as in this Design; indeed no characteristic of any style or manner ought to be servilely imitated, when that imitation would prove inconsistent with utility or convenience. When one age or country borrows the architecture of any other, it must be modified in such a

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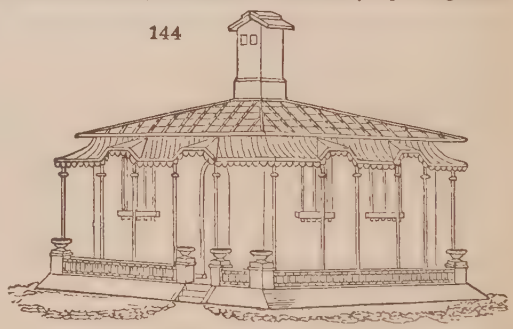

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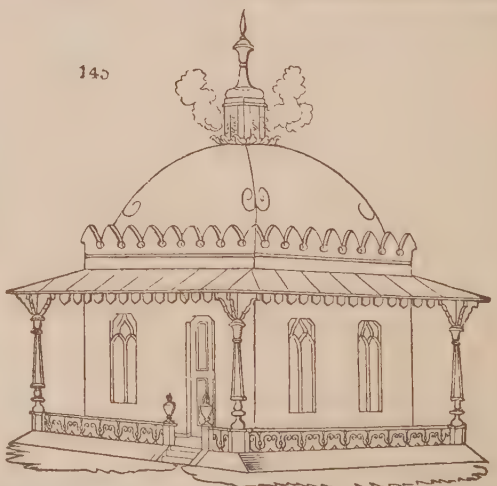

manner as to suit the new locality to which it is applied; and the hand of he master is shown in effecting this modification in the spirit of the original style.

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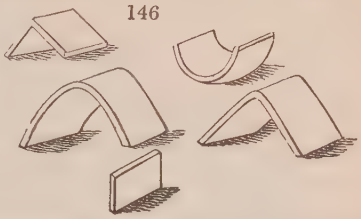

173. *Ornament or Variation.* A veranda, and a common Italian parapet, would serve to decorate this Design, fig. 144; while, if it were desirable to adapt a different elevation to the same plan, any of the Gothic styles indicated in figs. 138, 139, and 140, § 164, might be adopted; or recourse might be had to the Indian Gothic, fig. 145. The Italian parapet is formed by tiles of any kind, but not longer than six or eight inches, fig. 146, piled

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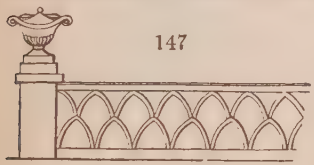

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up between piers, as in figs. 147, 148, 149, 150, 151, and 152. It is easy to conceive that

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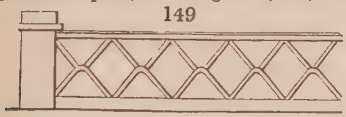

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numerous other variations of the same kind may be made in the same manner, by tiles of

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these and of other kinds, with or without the aid of bricks and paving tiles. A very hand

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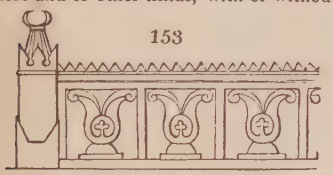

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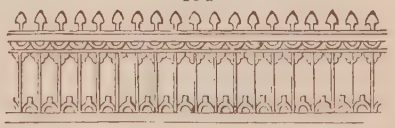

some parapet may be made by using small hollow draining tiles or tubes as balusters. To the Indian cottage, fig. 145, parapets may be contrived of appropriate Indian forms, figs. 153 and 154.

Design XX.—*A Dwelling for a Man and his Wife with Children, and having a Cow-house Pigsty, &c. attached.*

174. *Accommodation.* The ground plan consists of an entrance, *a*; kitchen, *b*; bed-closet, *c*; wash-house, *d*; bed-room, *e*; dairy, *f*; linen closet, *g*; pigsty, *h*; privy, *i*; pantry, *k*; and cow-house or wood-house, *l*. In the roof, there is one large bed-room, which may be seen in the section A, B; it is lighted from one end, but can only be ascended to by means of a ladder through the trap-door in the ceiling of the entrance lobby, *a*. A hen-house might be formed over the piggery or the cow-house; and rabbits, in hutches, might be kept in the latter building.

175. *Construction.* The inner walls are supposed to be of rubble stone, as being the cheapest material in the given locality; the outer walls are of brick, and hollow; the roof is thatched. The three-quarter columns shown in the front elevation, are supposed to be of wood; and the manner in which they are attached to the walls may be seen in fig. 155, which is a section through the lean-to from back to front.

176. *General Estimate.* Cubic contents, 11,142 feet, at 6*d.* per foot, £278 : 11*s.*; at 4*d.*, £185 : 14*s.*; and at 3*d.*, £139 : 5*s* : 6*d.*

177. *Expression.* To the eye which looks only at picturesque effect, this cottage will not

be unpleasing; but strictly examined on scientific principles, it is full of faults. The three quarter columns, supporting nothing but thatch, are absurdities: they are of no use as piers, because the wall is strong enough without them; and they are the more superfluous, because they are attached to the walls at the angles, which, as we have before shown (§74), are the strongest parts of the wall. A column is the noblest member of the architectural body, because it effects, of itself, and in a simple and striking manner, by one bold and independent form, what could otherwise be only effected by a great number of petty details of masonry or carpentry. As a support, it may be substituted for a wall; as a monument, it will serve the purpose of either a cone, a pyramid, or a tower; and placed horizontally over an opening, in the form of a beam, it takes the place of an arch. Of what other architectural member can so much be said? A column may be considered in architecture what a timber tree is in the vegetable kingdom; the first is one of the grandest objects of architectural art, and the second, one of the most imposing in the vegetable creation. It is the part of correct judgment always to adjust the means employed to the end to be attained; and in attempting to gain any end, never to call forth more energy than the occasion requires. When a wall is employed to support a roof, no wise architect will ever join columns to this wall; since, from what has been said of the uses of columns, it must be clear that, to place them there, would, in point of utility, be a mere waste of strength; and in point of order and beauty, it would be to degrade their character. To see a column misapplied in a building, is as offensive to a correct architectural eye, as it is to a well regulated mind to see misapplied wealth or power in the common affairs of life. Had there been an architrave of any sort over the capitals of the columns in the front of Design XX. they would have had some pretensions to fitness, by appearing to support it, and having thereby an air of completeness; but merely set against the wall without any conspicuous superincumbent member of the roof, and immediately under the projecting thatch, they show an apparent disregard, not only of the principle of utility, but of that of congruity. A second fault is the placing of two false windows in the wings, which, in the elevation, are so shaded that it is impossible to detect them as such. This, in a drawing, is

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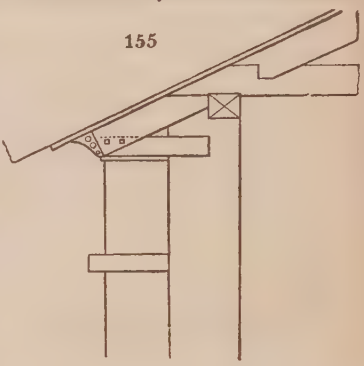

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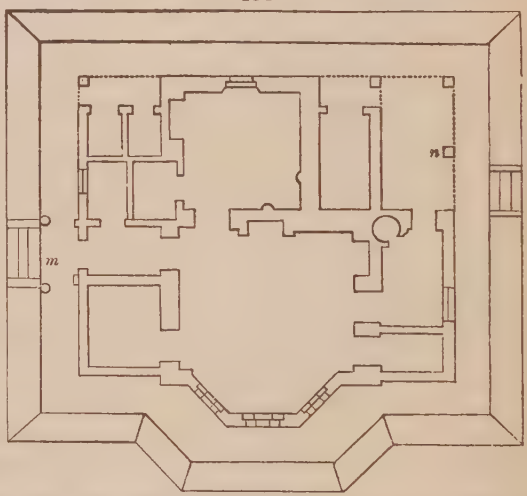

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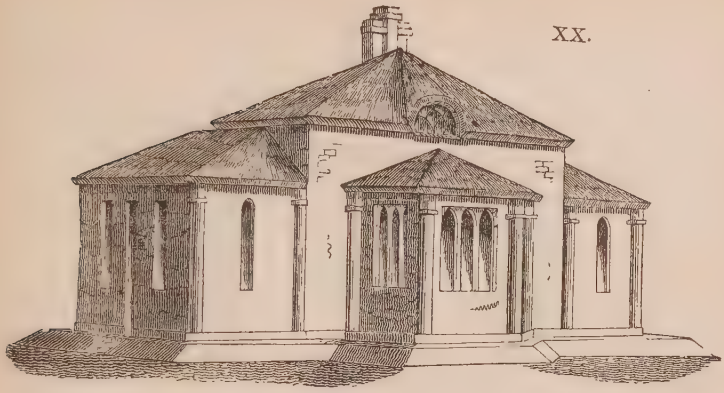
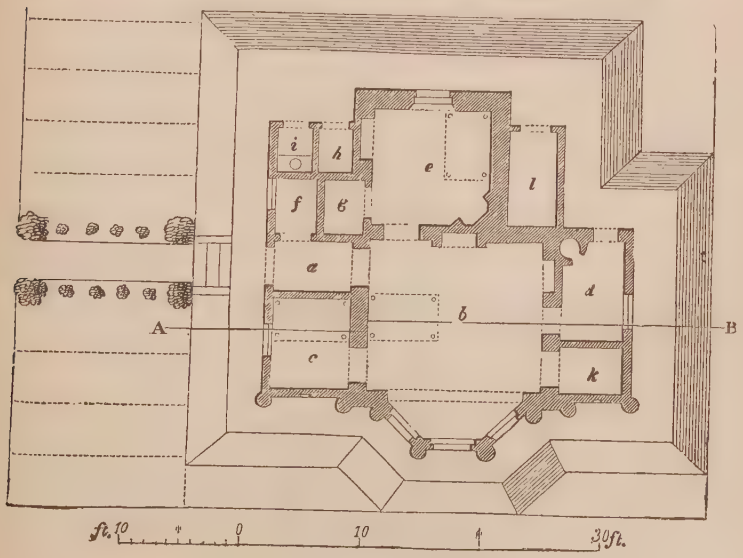
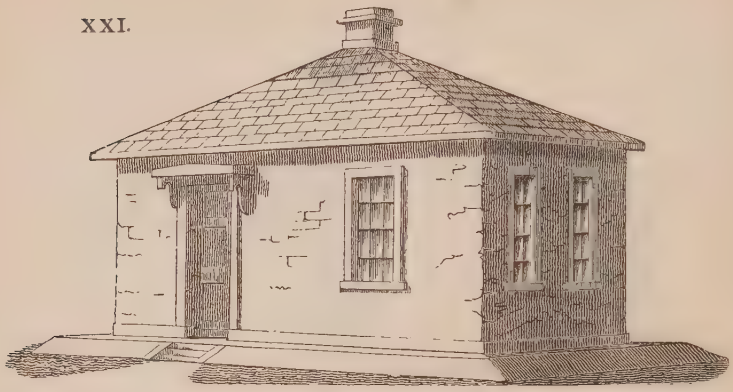
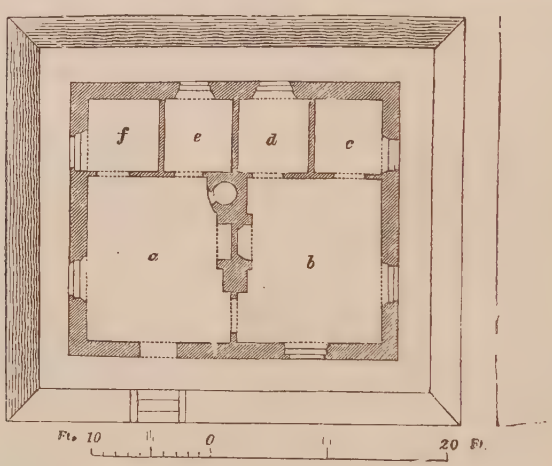
XX.

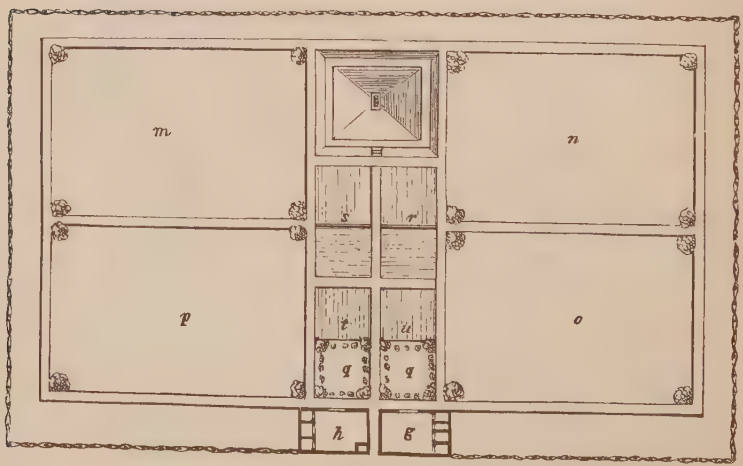




XXI.







liable to be considered as a deception practised on the inexperienced eye, and an architect might thereby mislead his employer. Perhaps the architect may say that he intends glass to be put in these windows, in which case they would not be distinguishable from real ones, either in the drawing, or in the reality. If so, our objections are less strong; but still we disapprove of the expense of false windows in such a building as a cottage. A third objection to this dwelling is, that sufficient consequence is not given to the entrance. So large a cottage, and one of so much pretension, ought surely not to be entered as it were by stealth. One other objection, and we have done:—the window in the roof is too low, and not fit for ventilating sufficiently, so large a room as the one it opens into.

178. *Improvement.* We would remove the three-quarter columns and the false windows; place a porch over the main door, fig. 156, *m*, and extend the roof of the back kitchen in such a manner as to form a covered area for drying clothes, fig. 156, *n*, which might also serve as a play-ground for children, or, in hot countries, for occasionally dining under. We would also enlarge and raise the window in the roof, because there can be no perfect ventilation unless windows reach nearly to the ceiling. This done, the ground plan would be as in fig. 156, and the elevation (chimney pots and a terrace parapet being added), as in fig. 157.

Design XXI.—*A Dwelling for a Man and his Wife, without Children.*

179. *Accommodation.* We have here, in a compact form, and under a pavillion roof, a dwelling of the humblest class; very well calculated for two persons, but not for more. It contains a kitchen, *a*, in which is an oven; a bed-room, *b*; two light closets from the bed-room, *c* and *d*; and two from the kitchen, *e* and *f*. In this, as in most of the preceding Designs, some accommodation for lumber may be obtained in the roof, to which there should be an opening in the ceiling, closed by a door, with a hinged ladder, for ascent and descent. This ladder when not in use, is easily kept suspended to the ceiling, by a hook at one end. By substituting hooks and staples, as in fig. 158, for hinges, the ladder may be taken off at pleasure, and used for other purposes

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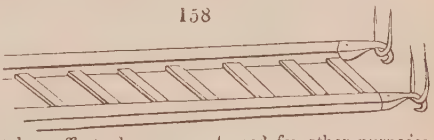

The cow-house and yard, *g*; and the pigsty, poultry-house, place between them for fuel, liquid manure tank, and privy, *k*, are supposed to be placed in the garden.

180. *Construction.* The walls may be of earth, rough stone, or whatever may be the cheapest material in the particular locality. If they are built of brick, they should be made hollow, either according to the method already mentioned (§ 25), or according to that of Silverlock or of Dearn; both of which will be afterwards described. The roof in this dwelling is shown as covered with large slates. No gutter is added round the eaves, fig. 159, in this, as in many other of the Designs; because this essential accompaniment is of the same form in most buildings of the cottage kind, and is easily added, either as a tinned, copper, zinc, or cast-iron half cylinder. The most durable, the most convenient, and, ultimately, the cheapest gutter, is a segment of a hollow cast-iron pipe, fig. 160; supported by iron brackets, fig. 161. The brackets are nailed to the face of the eaves, as at fig. 159, *k*, and have sometimes rivetted to them tinned iron straps, fig. 162, *l*, the ends of which are folded over the gutter, to hold it in its place. Each length of gutter overlaps the other; and when the slope, for giving a current to the water, is less than one inch in a yard, the one piece of gutter is bedded on the other in putty, or in white lead. If the water is not to be preserved for use, it may be conducted to a drain, by an upright pipe or tube, in one or two places (§ 84, figs. 60 and 61); but, if it is to be collected for filtration, the slope of the guttering, on all the sides of the house, ought to be directed to one point, where a descending tube should conduct the water to a receiving tank (see § 31).

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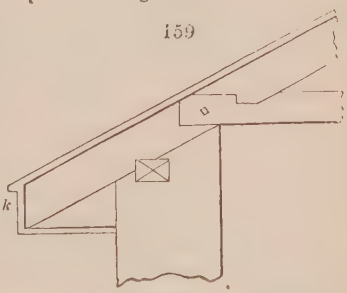

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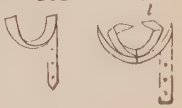

181. *The Garden* has four main compartments, *m*, *n*, *o*, and *p*, for the usual four year ro ation of kitchen crops; two small compartments, *q*, *q*, supposed to be used, the one, as a yard for faggot wood, &c., and the other as a rick-yard; and four small compartments, *r*, *s*, *t*, and *u*, for fruits, shrubs, and flowers.

182. *General Estimate.* Cubic contents, 11,178 feet, at 6*d.* per foot, £279 : 9*s.*; at 4*d.* £186 : 6*s.*; and at 3*d.*, £139 : 14*s* : 6*d.*

183. *Expression.* This Design, like the preceding one, aims at nothing more than the expression of the subject. To both, might be given a character of elegance, as well as a solid addition in point of comfort, by a surrounding veranda. To fit both these Designs for receiving this addition, the tops of the windows are kept two or three feet under the eaves. If the veranda were formed with an opaque roof, it would merely serve as a shelter, and a cover under which to dry clothes, seeds, Indian corn, and tobacco, and to work or walk under in rainy weather; but, if the roof were glazed, with a trellis under it, grapes and peaches might be grown all round the house (the diagonal of the square being a north and south line), and all the former advantages obtained in equal perfection. The architectural beauty of this Design, as well as its internal convenience, might be greatly heightened by a judicious porch, and by a window in the roof over the entrance door; but these improvements we leave to be contrived by our readers; requesting them to take out their pencils and make the attempt; and assuring them, that nothing will contribute more to their improvement, as architectural designers.

Design XXII.—*A Dwelling for a Gardener, or other Servant, on a Gentleman's Estate, who has a Wife, but no Children.*

184. *The Accommodation* of this cottage consists of a lobby, *a*; a small kitchen, *b*, with an oven; a light closet from the kitchen, *c*; and a bed-room, *d*, with a small light closet, *e*, which may be used as the gardener's library. This closet will be kept sufficiently dry and warm by its proximity to the oven. From the lobby, is portioned off a small closet for fuel, *f*.

185. *Construction.* The walls are supposed to be of common brick, or of flints, with piers and coins, in the form of pilasters, built of brick, of a superior description; or, if brick should not be the material employed, the plain part of the walls may be composed of rubble stone, or random jointed ashlar work (free stone, rough as it comes from the quarry, laid in irregular courses), and the pilasters of tooled stone. The plain parts of the walls may also be of earth, and the pilasters of brick or stone; or both the plain parts and pilasters may be built of earth; the former being rough cast, and the latter covered with cement, scored (lined) in imitation of stone, and lime-whited. The roof is framed at a low pitch (low angle of the sides), and covered with Italian semi-cylindrical tiles, fig. 163, in the manner practised in the neighbourhood of Florence, fig. 164. The chimney top, fig. 165, on a scale of half an inch to a foot, is built with a far projecting cornice, supported by blocks, with intervals between, suitable for swallows' nests. The windows would have been more in character with this manner of building, obviously somewhat Italian, if they had been formed of two frames, lengthways, the whole height of the window, and hinged at the sides, so as to open inwardly; but the comfort of a sash window to a poor man, in a cold climate like that of Britain, is so great, that the British architect may well feel justified in adopting it in preference to the Italian form. In a building of a higher class, or for a warmer country, we should, probably, not so easily have formed an excuse for him, because there is a real advantage in being able to throw open the entire space occupied by the window; and this never can be done in the case of suspended sash-windows, where no more can be opened than one-half.

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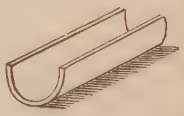

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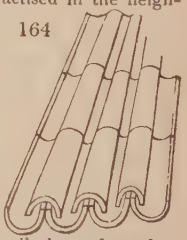

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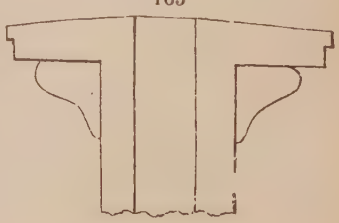
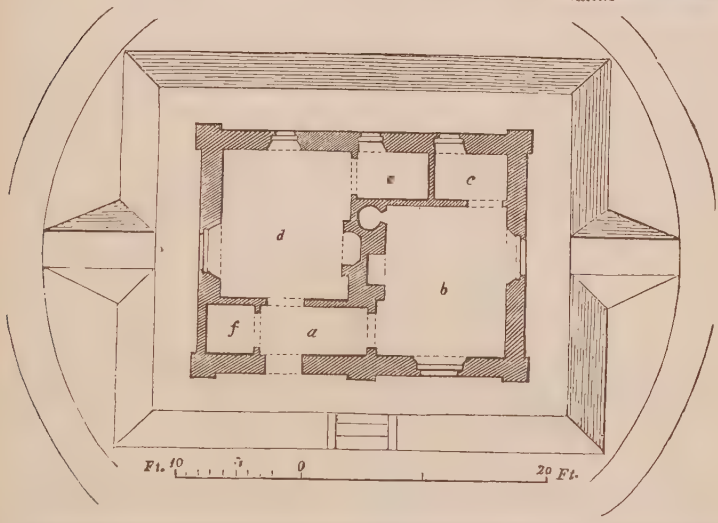
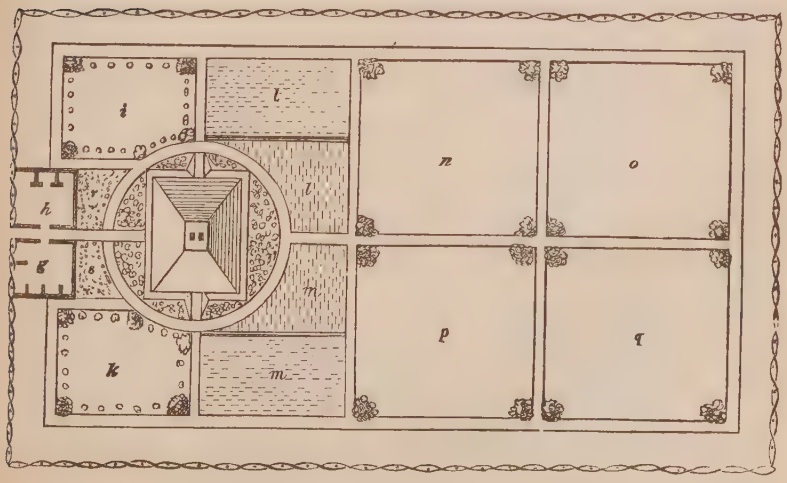


186. *Situation.* If this dwelling be erected for a gardener, it should, of course, be placed near the garden; and, if the health of the gardener, or that of his wife, be any object to the proprietor, it ought to be in a dry, open, airy situation; and not placed, as such houses very frequently are in Britain, among dug ground, thickly planted with trees and shrubs, where there can be neither good

XXII.





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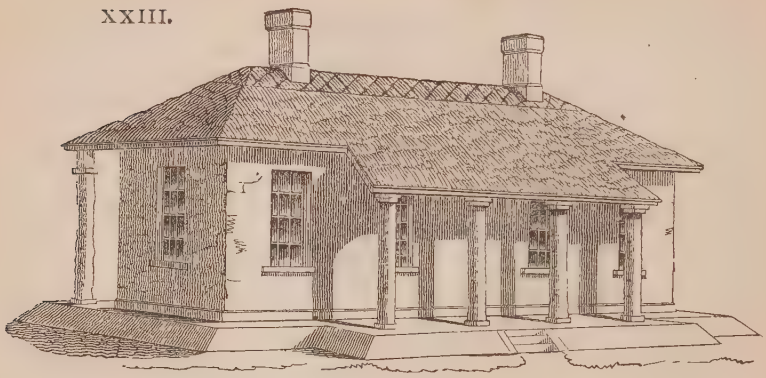

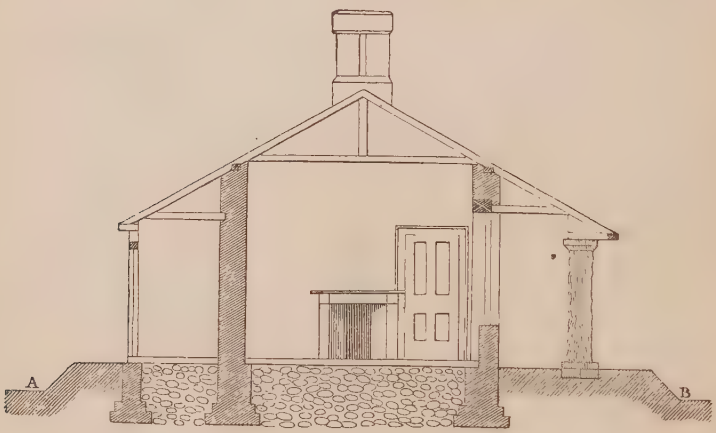

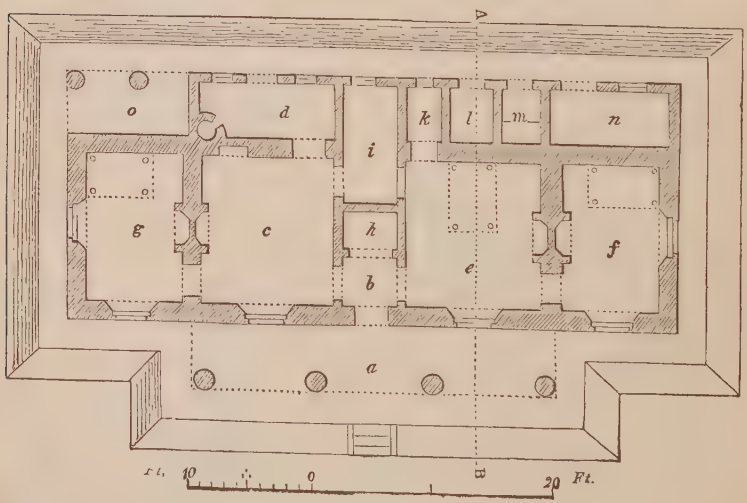

air, nor a free circulation of such air as there is. This Design is also well adapted for a lodge, and is worthy of being exposed to view on three sides, instead of being almost entirely covered with vegetation. The practice of almost entirely covering buildings in the country with creepers, can, by no means, be considered as in good taste: a few may be trained up a plain building, or a ruin; but to cover a handsome piece of architecture in this way, is to defeat the very intention for which that architecture was produced. In the country, all is vegetation: what beauty, therefore, can be expected from clothing with foliage an object, which, to produce any effect at all, must operate by contrast? In the town, all is architecture; and there, the introduction of vegetation of any kind on a building, can, in point of effect, hardly be carried too far. In the country, the white or grey walls of the plainest cottage, are a relief to the eye from the eternal monotony of green, by which such cottages are generally surrounded. In addition to this, it should never be forgotten that all vegetation near a house, especially that of deciduous plants, encourages damp and insects.

187 *Garden.* We have added a garden, on the supposition that this Design might be thought worth adoption, as a gate lodge, or by an independent labourer, or small farmer without children. We have shown in it a building, and yard, for two cows and two horses, *g*; and another yard with a privy, a place for pigs, another for poultry, and a third between them for wood, *h*. It is of great consequence that the floors of these buildings should be raised at least one foot above the surface of the yard, and that their walls should be of such a thickness as to ensure warmth to the animals. The necessity and advantage of this will appear in Book II. There are several small borders and angles, round the house and beneath its terrace or platform, which are supposed to be devoted to flowers and ornamental plants. There are two compartments, *i* and *k*, which, in the case of horses or cows being kept, might be devoted to lucerne, saintfoin, Hemerocállis, (see *Gard. Mag.* Vol. V. p. 451,) Symphytum, or some other perennial forage plant, according to the soil; in order that they may always afford food at a short notice, when it may be inconvenient to send to a greater distance. To a family of two persons without a servant, in Britain, and to small farmers in America and Australia, where servants or helpers, are scarcely to be got at any price, arrangements of this sort should always be kept in view. The four compartments, *l*, *l*, and *m*, *m*, may be used as a kitchen garden; and the four larger compartments, *n*, *o*, *p*, *q*, for growing corn crops. But if the garden is supposed to be on a smaller scale, and to contain only a quarter of an acre, instead of five acres, then these four large compartments may be devoted to the usual rotation of culinary vegetables; and the four smaller ones to a grass-plot for drying clothes, and to strawberries; either, or both. The two compartments, *r* and *s*, may serve for gooseberries, currants, and raspberries; fruits that ought to be in every cottage garden, where the climate is suitable for them.

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188. *In forming Grass-plots for drying Clothes,* where appearance is an object, there ought always to be tubes built in or inserted in the ground, for the purpose of holding the posts, to which lines for hanging the clothes on, are attached. These tubes, fig. 166, are generally about eighteen inches long and four inches wide inside at top, and three inches at bottom, with a plug, *t*, to cover each when its post is taken out and laid in the dry. Posts for being so used have a shoulder at their lower end, fig. 167, *u*, for preventing them from being wedged too firmly into the receiving box. The top of such a line post has generally two pins, *v*, passed through it in opposite directions, for the purpose of fastening the lines. In some situations, instead of moveable posts, the lines may be tied to fixed posts, ornamented by creepers; or to trees with narrow heads, such as the Lombardy poplar; or for some description of clothes, cords may be stretched under the far projecting eaves of the roof all round the house. One end of the cord in this case is fixed, and the other passes over a pulley, and is made fast to a hook in the wall. The advantage of passing a cord over a pulley, fig. 168, *w*, is, that the line may be lowered to receive the articles to be dried, and then hoisted up again. This mode of drying clothes is very common in Germany

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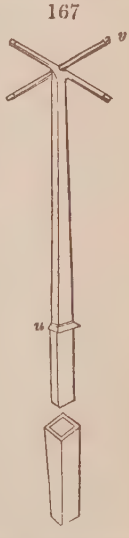

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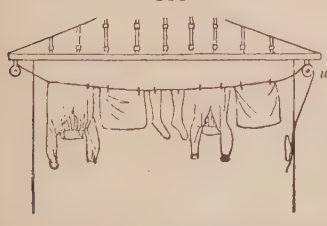
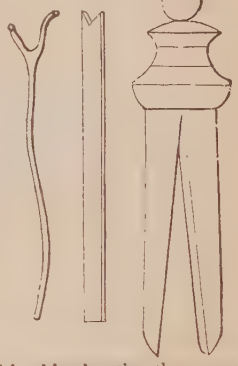


and Switzerland, and has the advantage of never exposing the clothes to perpendicular rain; with the disadvantage of running the risk of having the larger articles blown against the wall, and dirted and discoloured, in windy weather. Where very long lines are stretched from tree to tree, it is customary to support the line in the middle, or in one or two places by a prop, forked at one end, figs. 169, or 170; the weight of the clothes keeps these props steady. The clothes are kept fast on the lines by what are called clothes' pegs. These are commonly formed of a piece of cleft wood, held together by a fillet of tinned iron; but an elegant improvement on them has lately been made by Mr. Stenning, of Haslemere, under the direction of our highly talented contributor, Mr. Perry, of Godalming, fig. 171, by which the fillet of tin is rendered unnecessary, and all risk of iron-mould on the linen avoided.

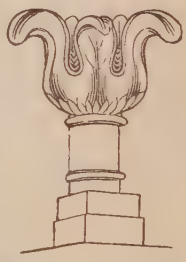
169 170 171



189. *General Estimate.* Cubic contents, 9,828 feet, at 6*d.* per foot, £245 : 14*s.*; at 4*d.*, £163 : 16*s.*; and at 3*d.*, £122 : 17*s.*

190. *Expression.* It is clear that something more is intended in this elevation than mere expression of purpose; else why the pilasters, the far projecting roof with its cantilevers, the semi-cylindrical tiles, and the swallow corniced chimney top? The manner intended to be expressed is evidently of the Italian kind, which is only diminished a little by the English sash window. If it were desired to decorate this cottage, it might be done by placing four ornamental tulip-shaped chimney pots, fig. 172, on the chimney tops, raising a low wall or parapet in the Italian manner, in bricks and tiles, at a very trifling expense, round the outer margin of the platform; and placing vases in harmony with the chimney pots, at the corners. An ornamental water-gutter, fig. 173, ought also to be used instead of a plain one. The dwelling might then be said to be in the enriched Italian style, and if no more trees were placed round it than what are shown in the ground plan of the garden, it could hardly fail to look well from every point of view. We leave our readers to embody these ideas in geometrical and perspective sketches of their own; and we may further suggest that by increasing the width of the terrace and veranda,

172



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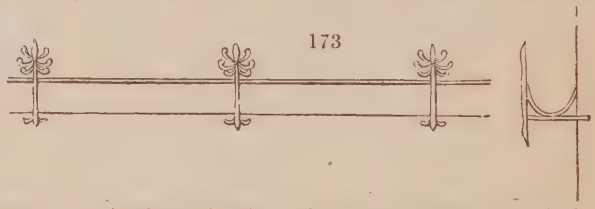


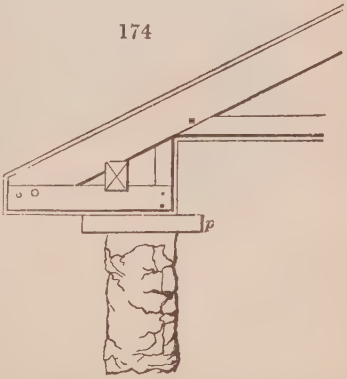
and adding a second story, a very handsome elevation, and a tolerably comfortable habitation (the walls still of earth), might be produced. The Italian manner of building cottages must naturally have more charms for such as have been in Italy, or are conversant with the works of the great painters of that country, than for those who have never travelled, or paid much attention to prints or paintings; but even to such persons an Italian cottage may please, when first erected, from its novelty; and afterwards, this satisfaction may be continued on the principle of contrast, or the difference between such a cottage and the generality of cottages in the neighbourhood. It is evident, however, that the great beauty of an Italian cottage, that in which the imagination is engaged, can only be fully realized by those minds in which it will call up associations connected with Italy. An old English cottage has this great beauty to every Englishman, educated or uneducated, that, in addition to all its comforts and conveniences, it operates upon his imagination, and recals to mind a thousand associations connected with his earlier years, with his parents, his kindred, his school companions, and, in short, with all the vivid feelings of his youth. It ought to be the business of the young architect, therefore, not only to inform himself on all that relates to actual fitness in a building, and to whatever contributes to the expression of purpose, but to those circumstances, in style, which are calculated to operate on the imagination. For this purpose, we recommend to him the careful and repeated perusal of *Allison's Essays on Taste*, *Wood's Letters of an Architect*, and *Dugald Stewart's Philosophical Essays*.

Design XXIII.—*A Dwelling of One Story, for a Man and his Wife with a Family of Children: having a Cow-house and Pigsty attached.*

191. *Accommodation.* The plan consists of a long broad portico, *a*, well adapted for drying clothes under, and protecting the children from the sun or rain while at play; an entrance lobby, *b*; a kitchen, *c*; a wash-house, *d*; three bed-rooms, *e*, *f*, and *g*; a pantry, *h*; dairy, *i*; store-closet, *k*; pigsty, *l*; privy, *m*; cow-house, *n*; and open shed for fuel, *o*.

192. *Construction.* The walls may be of earth; the props of the portico, and of the open shed, trunks of trees with their bark on; the roof is thatched with reeds, heath, straw, or the shavings and dressings of barrel hoops, made from green rods, as practised in various parts of England. In countries where timber is very abundant, and other materials dear, the roof may be covered with shingles; but materials so liable to be consumed by fire, should never be employed if it can be avoided. The rustic columns may be placed on stone plinths, and have square wooden caps, fig. 174, *p*. In a country having a long winter, and liable to heavy falls of snow, it might be desirable to have the roof of such a cottage considerably steeper; because the melting of snow on flat roofs, or even any roofs which are under an angle, or pitch, as the technical term is, of 45°, is generally attended by water penetrating to the interior. Thatched roofs in snowy countries, unless very steep, are of particularly short duration; and the same may be said of roofs covered with bark, heath, moss, ferns, or spray. These kinds of roof occur often in Sweden and Norway, but they are never resorted to when the builder can afford slate, or flat stone, or iron. One of the best modes of constructing flat roofs in a country liable to heavy falls of snow, would be to employ flat brick arches, tying the abutments together with wrought-iron rods, in the manner which will be afterwards mentioned. In Italy, and in other countries where stucco, puzzulano earth, or any other cement is abundant and cheap, flat roofs are not uncommon. The joists, or rafters, are first covered with boards, then with tiles, or sometimes with reeds; and afterwards, first with a coat of stucco, mixed with gravel, or very coarse sand; and, lastly, with a finishing coat of finer material.

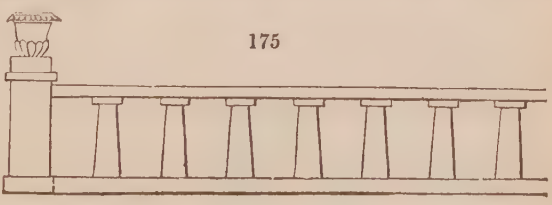
174



193. *General Estimate.* Cubic contents 14,622 feet, at 6*d*. per foot, £365 : 11*s*.; at 4*d*., £243 : 14*s*.; and at 3*d*., £182 : 15*s* : 6*d*.

194. *Expression.* This cottage pretends to nothing more than what it is; a simple, humble dwelling, but not without comfort. In a cold country, we should propose to heat all the floors by flues conducted from one fireplace in the back kitchen, *d*; thereby rendering the dwelling, at a mere trifle of expense and trouble, as comfortable as even a first-rate mansion could possibly be (see § 34). This would also greatly diminish the expense of fuel, the labour attendant on keeping up fires, and that of cleaning fireplaces. As a finish to this cottage, the platform may be bordered with a neat hedge of box, or furze, or butcher's broom, or an ivied trellis; or by a rustic fence, composed of the trunks of small pine or fir trees, driven into the ground at equal distances, sawn evenly over at the height of two feet and a half, and finished with a horizontal railing of the same material, or of worked timber painted, fig. 175, to a scale of a quarter of an inch to a foot. Ornamental urn chimney pots, fig. 176, and one or two creepers, would complete all the ornaments proper for such a cottage.

175



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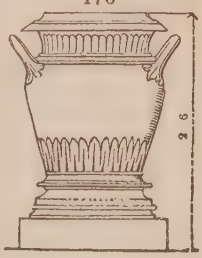

Design XXIV.—*A Dwelling for a Man and his Wife without Children, having Two Rooms and other conveniences.*

195. *Accommodation.* For a small family this may be considered a comfortable cottage. It contains a porch, within which is a lobby, *a*; kitchen, *b*; bed-room, *c*; store-closet, *d*; back kitchen, from which the whole house may be heated, *e*; pantry, *f*; dairy, *g*; privy, *h*; root cellar, *i*; and wood-house, *k*.

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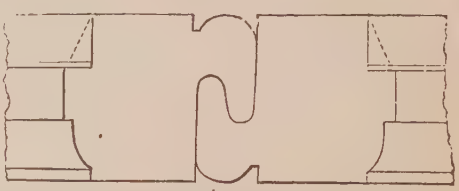
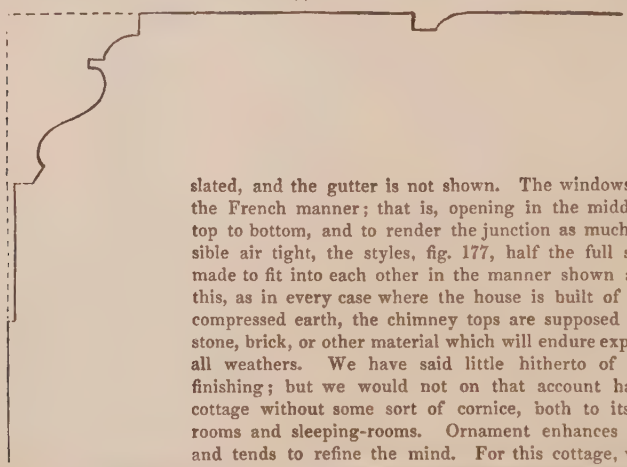


196. *Construction.* The walls may be of earth, or of any other convenient material; the roof we have supposed to be slated, and the gutter is not shown. The windows are in the French manner; that is, opening in the middle from top to bottom, and to render the junction as much as possible air tight, the styles, fig. 177, half the full size, are made to fit into each other in the manner shown at *l*. In this, as in every case where the house is built of mud, or compressed earth, the chimney tops are supposed to be of stone, brick, or other material which will endure exposure to all weathers. We have said little hitherto of internal finishing; but we would not on that account have any cottage without some sort of cornice, both to its living-rooms and sleeping-rooms. Ornament enhances comfort, and tends to refine the mind. For this cottage, which is somewhat in the Italian manner, fig. 178, to the scale of two inches and a half to a foot, may serve as the section of a cornice for the living-rooms, and fig. 179, to the same scale, for the bed-rooms.

178



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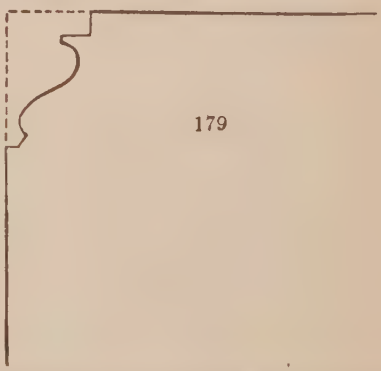
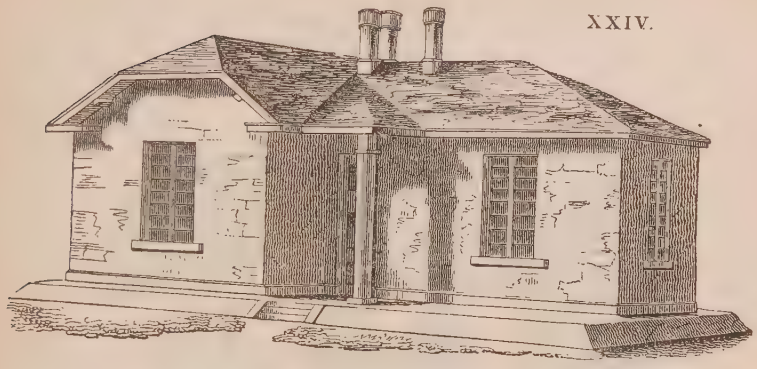
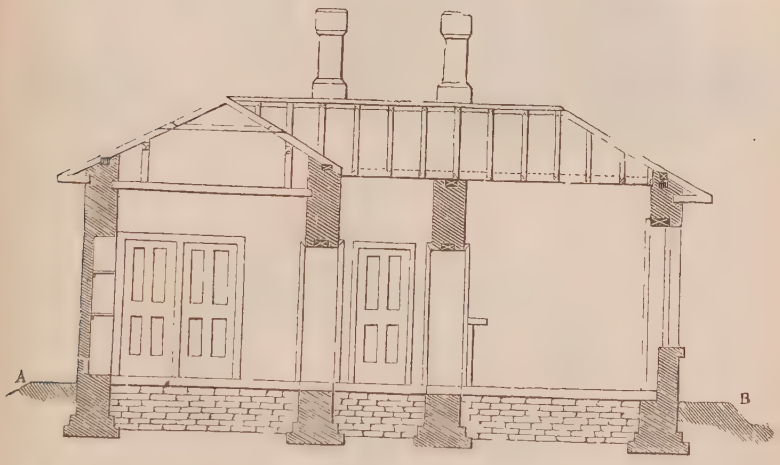


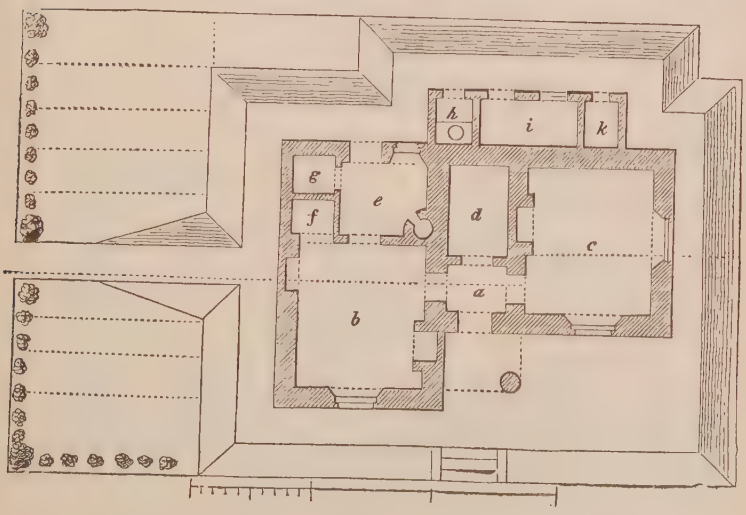
197. *General Estimate.* Cubic contents 10,920 feet, at 6*d*. per foot, £273; at 4*d*., £182; and at 3*d*., £136 : 10*s*.

198. *Expression.* Something more than a common cottage dwelling is here intended; but there are, in our eyes, two conspicuous faults; the first is the hipped or rather truncated angle of the pediment roof; and the second, the want of height and boldness in the chimney tops. These defects supplied, and a window added to show that some use was made of the garret, with a veranda and parapet or balustrade, the effect to us would be satisfactory. We again recommend our readers to attempt to realize these improvements on paper. The benefit they will derive from so doing, is far greater than may at first sight appear. The mere circumstance of familiarizing the mind with orderly arrangement, regular figures, symmetry, means adapted to the end in view, either in buildings, in furniture, or in gardens, must have an influence on conduct. Order is the fundamental principle of all morals: for what is immorality but a disturbance of the order of civilized society, a disturbance of the relations between man and man? We do not say that all kinds of drawing have a tendency to produce an orderly mind, but we do affirm that architectural drawing has that tendency in an eminent degree. Carpenters and stone masons are a superior class of mechanics in all countries.

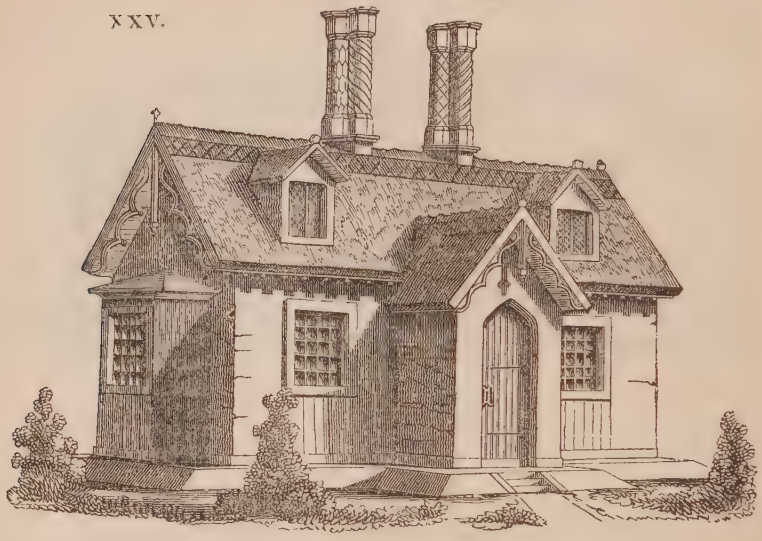
XXIV.

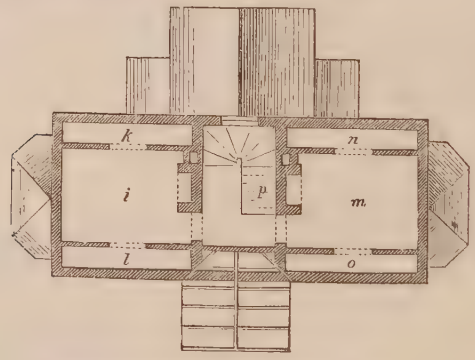


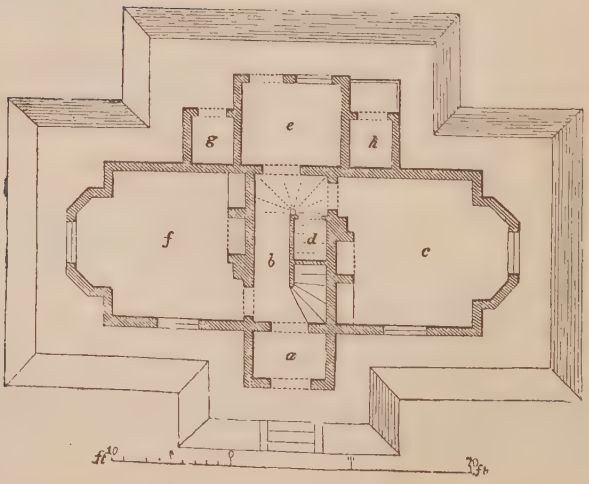




XXV.



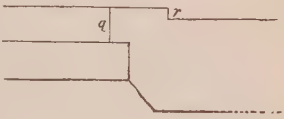




Design XXV.—*A Dwelling for a Working Man with a Family of Children.*

199. *Accommodation.* The ground plan exhibits a porch, *a*; staircase and passage, *b*; kitchen, *c*; closet under the stair, *d*; back kitchen, *e*; sitting-room, with small closet, *f*, privy, *g*; and wood-house, *h*. The chamber floor contains a bed-room, *i*; closet, *k*; another closet, *l*; a bed-room, *m*; two closets, *n* and *o*; and the staircase and landing, *p*. The defect in the accommodation here, is the want of a proper pantry; but this might be easily obtained by enlarging *h*, turning its present door into a window, and opening a door to it from the kitchen. A substitute for *h*, may be provided adjoining *g*.

180



200. *Construction.* This cottage, its designer observes, "may be built of brick stud-work, plastered outside, the roof to be thatched with reeds or straw. The entrance is to have a ledged door, and the windows are to be filled in with lattice-work, having oak mullions, or mullions of other timber, painted in imitation of stone. The rabbet heads of the windows, fig. 180, *q*, to be back filled, (to project beyond the wall, in the manner of architraves, but without mouldings, as at *r*)." The chimney stacks to be formed of, or ornamented with, Roman cement. The barge boards and the pendants to be finished as in the working drawing, fig. 181, made to a scale of half an inch to a foot, in which *s*, *s*, are the barge boards, and *t*, the pendant. Fig. 182, shows a section of a suitable cornice for the living-rooms; and fig. 183, one in the same style for the bed-rooms; both these sections are to a scale of two inches and a half to a foot.

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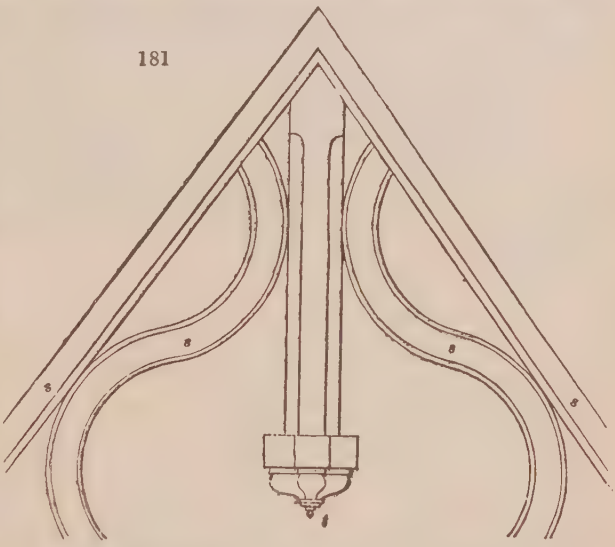

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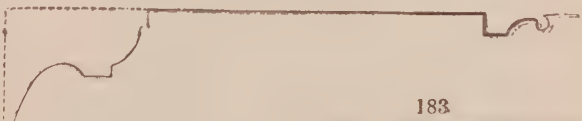

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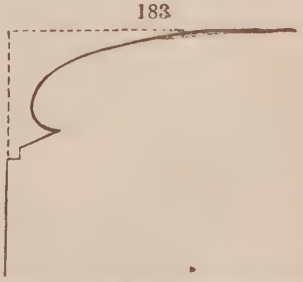


201. *General Estimate.* Cubic contents, 10,904 feet, at 6*d.* per foot, £272 : 6*s.*; at 4*d.*, £181 : 10*s* : 8*d.*; and at 3*d.*, £136 : 3*s.*

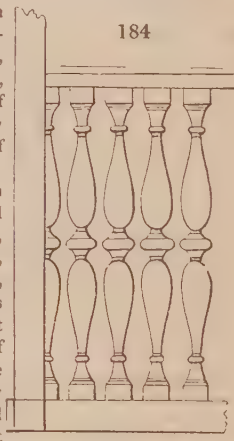
202. *The Expression* is evidently that of an old English cottage. We should have preferred the chamber windows in the ends, which would have been less picturesque in effect, but cheaper to execute, and much easier to keep in repair. We should also prefer the ground floor windows to have six large panes in each frame, rather than to have them filled in with lattice-work. This done, and the alteration made in the accommodation, which we have suggested, § 199, a parapet on the platform and pinnacles over the pendants, are all that are wanting to render this Design very much to our taste

Design XXVI.—*A Cottage Dwelling in the German Swiss Style for a Man and his Family, with accommodation for two Horses and a Cow.*

203. *Accommodation.* This description of dwelling is common in the northern parts of the continent of Europe, and also in Switzerland. To economize heat, no less than to save expense in the first erection, the apartments for the domestic animals, and the places for carts, ploughs, and other country machines and implements, are all contained under the same roof. The occupier of such a dwelling is commonly a very small farmer, who joins to this occupation some description of trade or commerce; such as a carrier, coach-driver, jobber in cattle, fisherman, hunter, &c. There is a great objection to having cattle and horses under the same roof with living rooms for human beings, on account of the smells and insects generated by the former; but it must be recollected that in the warm season, the cattle are seldom in the house, and that during winter in the North of Europe, the great difficulty in human dwellings is to maintain heat. We have lodged in various dwellings of this description, from Stockholm to Naples, both in summer and winter, and cannot recollect that we ever felt much inconvenience from smells, but certainly some from insects. We do not, however, recommend this Design, where the expense of erecting the offices apart from the dwellings is not an object.—In the ground plan of this building, we have a place for a cart, waggon, or other carriage, and for ploughs and other implements of agriculture or trade, *a*; a three-stalled stable for two horses and a cow, *b*; a back kitchen, *c*; a privy, *d*; and a pigsty, *e*. On the principal floor, we have an entrance under a porch, ascended to by an exterior stair, *f*; a sitting-room, *g*; pantry, *h*; light closet, *i*; kitchen, *k*; closet under the stairs, *l*; bed-room stairs, *m*; and three balconies, *n*, *n*, *n*. The chamber floor consists of two bed-rooms, and two bed-closets.

204. *Construction.* The foundations, and the first story, as high as the floor of the living-rooms, are supposed to be built of stone, or brick with rusticated stone corners; the upper part of the building is entirely of timber. The roof is shown as covered with thatch, and without gutters. In Switzerland, where timber is abundant, and labour not high, the railing for the stairs and balconies of such a building is commonly massive, and very curiously carved. We have given a specimen, fig. 184, on a scale of half an inch to a foot, of a suitable railing to such a balcony.

184

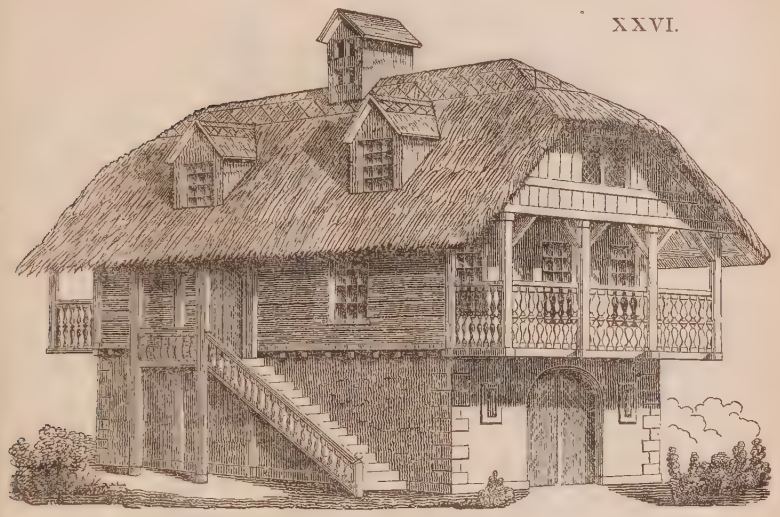


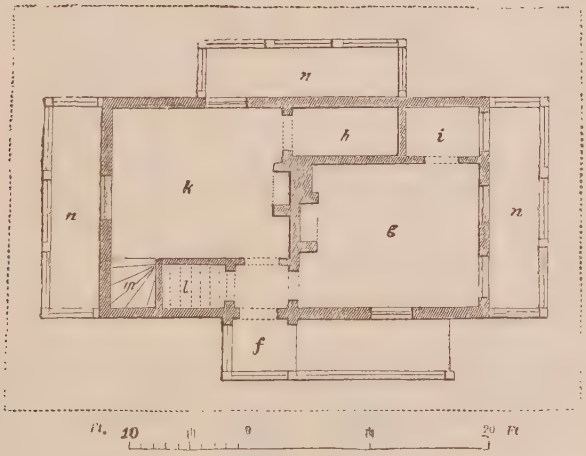
205. *Situation.* Were such a building to be erected in England, it could only be for the sake of its character, and therefore the proper situation for it would be in a romantic, woody vale, glen, or dingle, like those of the South of Germany, and especially the valley of Kinzigthal, from a cottage in which, engraved and published, the idea of the present Design is taken. There are many situations in Wales, and in the West of England, and some in Scotland, where the appearance of such a cottage would raise up interesting associations in the mind of a continental traveller, and would fill the stationary inhabitants with surprise, and by exciting inquiry, might lead to the improvement of their taste. We are naturally indifferent about what we do not understand; but the moment we begin to have a knowledge of any subject, we take an interest in it, which incites us to further inquiry, and ultimately brings us to an acquaintance with what is right or wrong, beautiful or deformed. To teach men to think is the grand object of every effort for promoting human improvement.

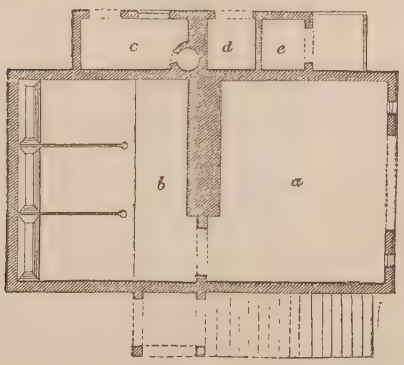
206. *General Estimate.* Cubic contents, 16,980 feet, at 6*d.* per foot, £424 : 10*s.*; at 4*d.*, £283; and at 3*d.*, £212 : 5*s.*

207. *Criticism.* The effect of the walls of the ground story being of stone is good, by giving the idea of great solidity in itself, and of stability and security in the superstructure. The three balconies are calculated to be very useful, and are not liable to the same objection as those exhibited in Design IX.; because they are not connected with any of the bed-room windows (see § 106). The outside stair, by artificially increasing the distance between the living-rooms and the stable, must in some measure diminish the quantity of effluvia from the cattle, conveyed thither by the clothes of those who attend on them. The eaves ought to have the addition of an ample gutter; and for our own taste, we should have preferred having two windows in each gable end, and none in the roof; dividing the garrets lengthways. We should not have truncated the gable, and we should have made a better preparation for the chimney stack, raising it higher, and in a bolder style.

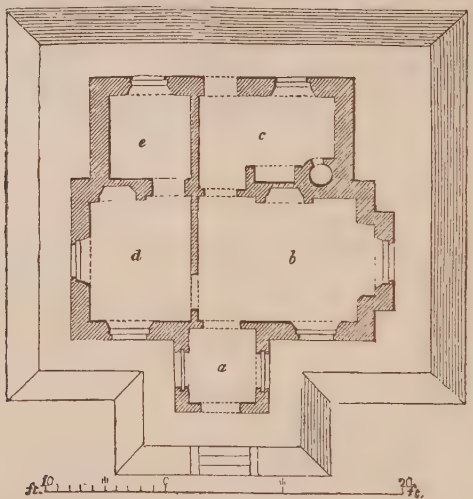
XXVI.

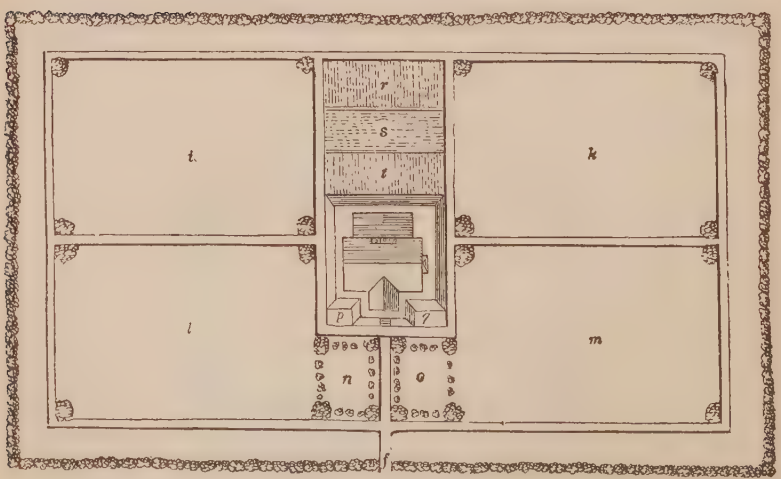






XXVII.

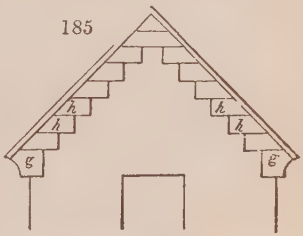




Design XXVII.—*A Dwelling for a Man and his Wife, with Children, or a Servant, with the usual Conveniences in a detached Building.*

208. *Accommodation.* This plan exhibits a porch, *a*; kitchen, *b*; back kitchen, *c*; parlour, or family bed-room, *d*; and children, or servants' bed-room, *e*. The privy, pigsty, cow-house, and similar appendages are supposed to be placed in a small yard, opposite the entrance to the garden, *f*. If this were the case, a wash-house might also be erected there; the apartment, *c*, being used as a kitchen, and *b*, as a parlour. This cottage might then be suitable for a small farmer, or jobber.

185

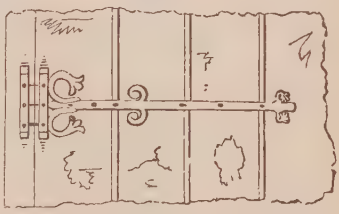


209. *Construction.* The walls may be of rubble stone, small land stones, or flints, set in good mortar. They may be finished at the gable ends with summer stones (stones placed on a wall, or on piers, for the support of beams, or on the lower angle of gable ends, fig. 185, *g*, as an abutment of the barge stones, *h*), having worked cornices, fig. 186, and stone pinnacles. The roof may be of plain tiles or slates; the windows are shown as common sashes with large panes, hung in the usual manner. The door is ledged, with ornamental outside hinges, fig. 187, to a scale of three-quarters of an inch to a foot. The chimney tops may be of Austin's cement, or of soft stone.

186

210. *The Garden* contains two roods and a half; it is surrounded by a hedge of fruit trees, within which is a border, and walk; and the interior is in four main compartments, *i*, *k*, *l*, *m*, for the usual rotation; with two small plots, *n*, *o*, for fruit shrubs; two still smaller, *p*, *q*, for flowers; and three, *r*, *s*, *t*, for strawberries, tart rhubarb, and perennial pot and sweet herbs.

187

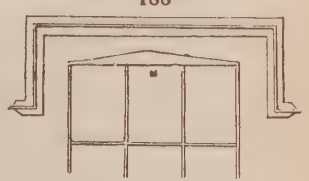


211. *General Estimate.* Cubic contents, 9,024 feet, at 6*d.* per foot, £225 : 12*s.*; at 4*d.*, £150 : 8*s.*; and at 3*d.* £112 : 16*s.*

212. *Situation.* The designer of this building states, that it will have a good effect as a gardener's house, placed in the garden, in cases where the gardener is a single man. The apartment, *d*, may be the gardener's library and office; and *e*, his bed-room. He also thinks that it might answer well for a small proprietor in North America; the farm lands surrounding the garden; or the garden placed near a public road. The house having windows on all sides, it ought evidently to be placed in an open, airy situation.

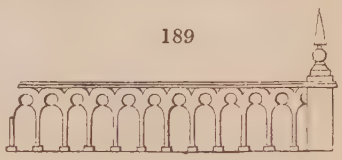
213. *Expression.* Something Gothic; and, from the cross over the entrance front, bordering on the ecclesiastical style. This expression is counteracted in a small degree by the modern windows; but more is gained to the inhabitant in comfort by those windows, than is lost to the man of reasoning taste, by this deviation from the details of correct style. However, as the comfort of a single man, for example, a gardener in his garden, is of much less consequence than that of a family, we see no objection to completing the effect of such a building by introducing mullions in the windows with lattice-work, and labels over them (a label, or hood moulding, is an outer moulding, crowning a door or window head, either plain or carved, and always returned at the ends, when straight, fig. 188); or, pointed topped windows may be employed; and, instead of lattice-work, with those very small panes, called by glaziers quarries (perhaps from *carré*, French, square), large panes may be used. It would also be an im-

188



provement to carry the chimney tops higher, and to have a panelled entrance door, studded with cast-iron nails, substituted for the ledged one; which, with a neat architectural parapet, fig. 189, would form a finish to the platform. The effect of the whole would thus be enriched, and rendered more characteristic of the style so obviously indicated; and it may be tried by such of our readers as can use a pencil, for themselves. We may remark incidentally, that the mere circumstance of deviating from the straight line in a very small degree in the window opening, as in fig. 188, at *u*, adds materially to the effect of that window, as a Gothic one. The more obvious forms of Gothic architecture are so universally known in this country, that the slightest line in a building which has an allusion to them, operates upon the imagination and at once gives the idea of style.

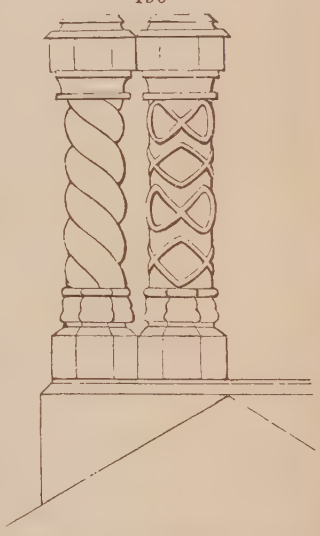
189



Design XXVIII.—*A Cottage in the Old English manner, containing a Kitchen, Living Room, and two Bed Rooms.*

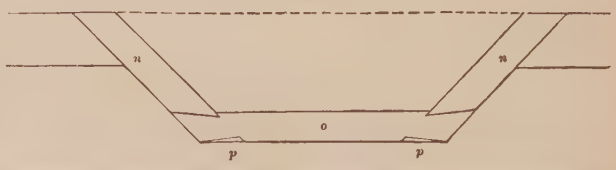
214. *Accommodation.* The ground floor contains an entrance-lobby, *a*; back kitchen with oven, *b*; best kitchen or living-room, *c*; closet under the stair, *d*; stair to the bed-rooms, *e*; privy, *f*; and place for wood, pigs, or poultry, *g*. In the chamber floor, there are two bed-rooms; the largest, *h*, which is entered from the staircase, *i*, has a small closet, *k*; the other bed-room, *l*, has a press near the fireplace; and chests, and other articles, may stand in the passage, *m*.

190

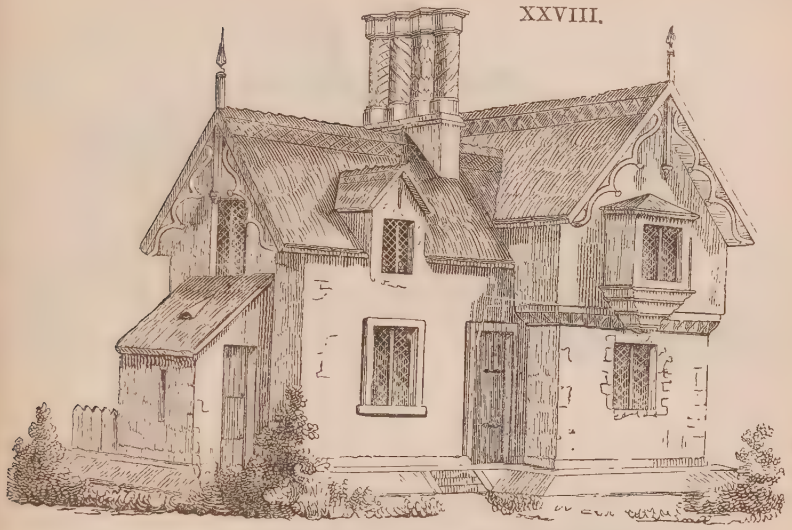


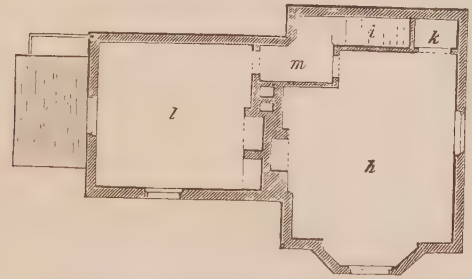
215. *Construction.* The walls, as high as the bed-room floor, are of brick; and from the bed-room floor to the roof, of stud-work, or brick nogging plastered. The chimneys, fig. 190, are of brick, covered with composition; or they may be formed entirely of artificial stone. The roof is supposed to be thatched; the windows of lattice-work, and the doors ledged. The large projecting window in the centre of the gable end, is called an oriel, or bay, or compass window, and is constructed in the following manner, viz. heart of oak bearers, fig. 191, *n*, *n*, are projected from the walls at the given height in a horizontal position, and generally so as to form an angle with the wall of 45°. The ends of these beams are inserted in the walls, and the brick-work is carried up over them, so that they are retained in their places by the whole weight of the superincumbent structure. By these means the diagonal beams afford a sufficient support to a parallel beam, *o*, which is dovetailed into the diagonal ones, as shown at *p*, *p*. The opening below the beams is covered in by the moulded boarding, *q*, in fig. 192, to a scale of three-eighths of an inch to a foot, and the section of the front, or parallel beam, *o*, is covered by the weather-boarding, *r*. The beams, *n*, *n*, ought to be of strong sound timber, and not less than fourteen inches by twelve inches. Oriel windows are generally constructed of wood-work, as being lighter than any other material; but beams of the above dimensions are sufficient to support a wall of brick or stone. The manner in which oriel windows of stone are carried up, is founded on the same principle, and will be described hereafter. Round the inside of these windows, are generally formed seats, which commonly open in front, at *s*; or at the top, like a ship's locker; so as to serve at the same time as a chest and a seat. Formerly these seats were called binks, bins, or bunkers, possibly a corruption of the French word, *banc*. The barge

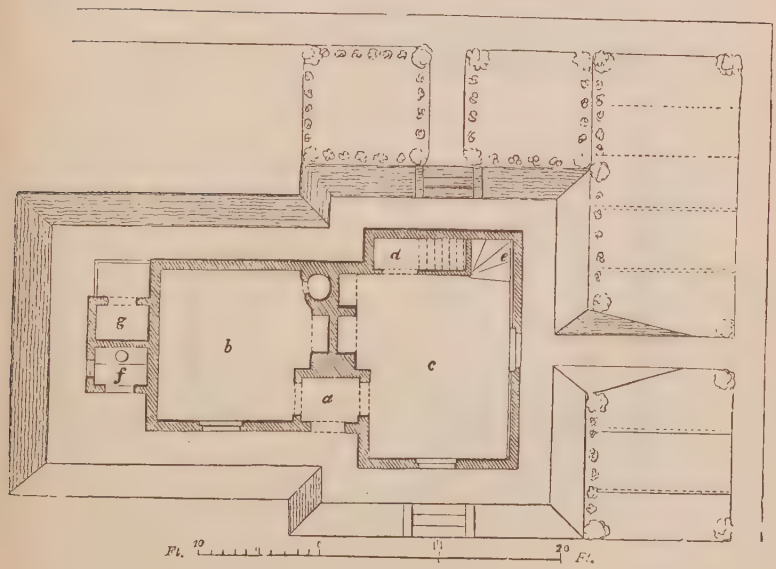
191



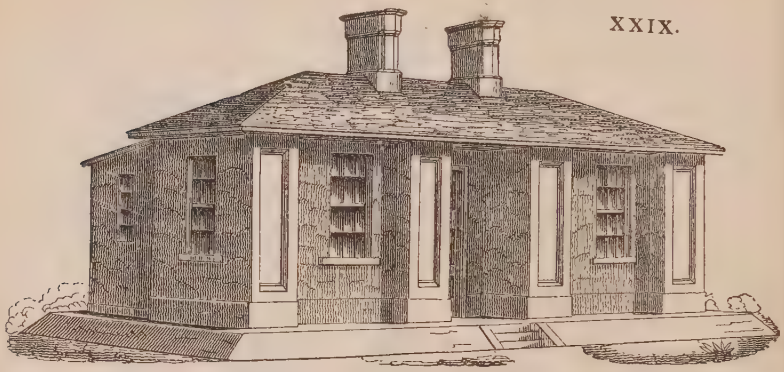
XXVIII.

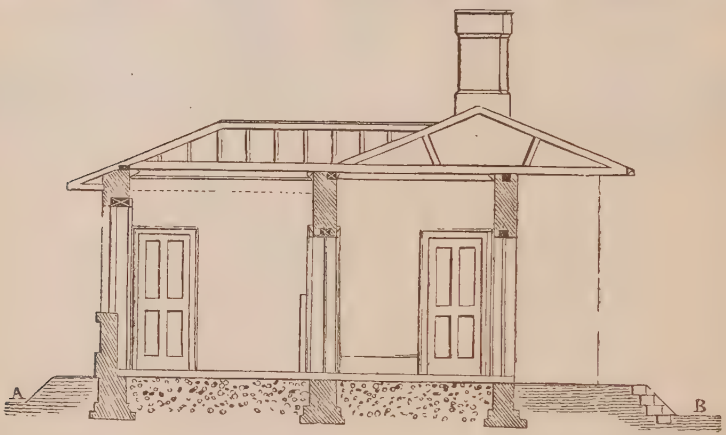


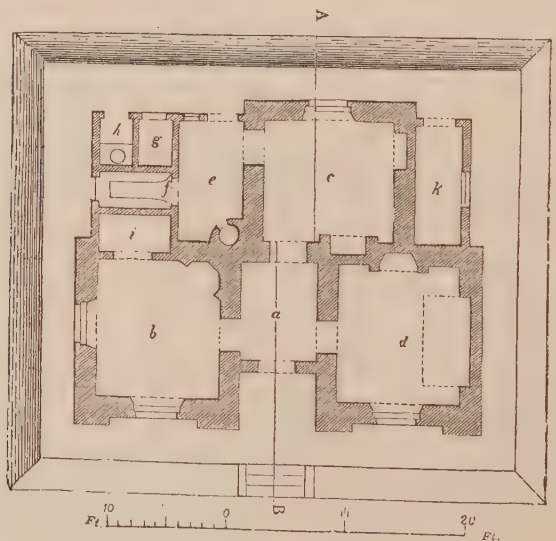




XXIX.

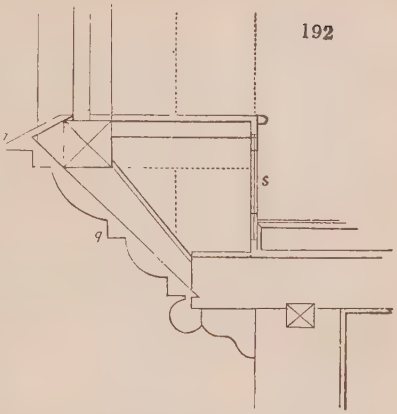






boards, and pendants, both for the gable ends and windows, may be varied at pleasure; and they form very fit subjects of composition for exercising the ingenuity of our female readers. The enclosure to the pigsty is of oak pales.

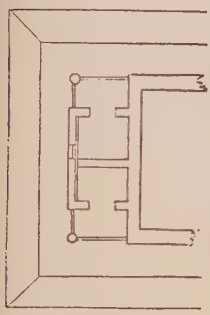
192



216. *General Estimate.* Cubic contents, 10,544 feet. at 6*d.* per foot, £263 : 12*s.*; at 4*d.*, £175 : 14*s* : 8*d.*; and at 3*d.*, £131 : 16*s.*

217. *Remarks.* This cottage is disfigured, rather than otherwise, by the two appendages, *f*, and *g*, at the end; not but what these appendages are essentially requisite, but that they are given in a mean and common-place manner. The door of *f*, is also in too conspicuous a situation, and is too nearly resembling the door of the main entrance. In other respects the building is picturesque; expressive of what it pretends to be, an old English cottage; and not uncomfortable within. The mean character of the lean-to at the end, and the nakedness of the door of *f*, may very easily be remedied; as a glance at the ground plan, in Design XXVIII., and another afterwards at the plan, fig. 193, and at the view of the end of the cottage, as so altered, fig. 194, will sufficiently prove.

193



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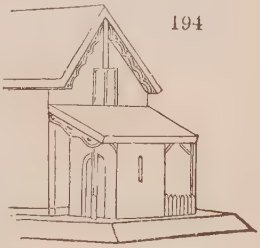
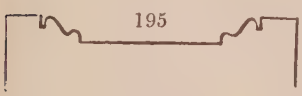


Design XXIX.—*A Cottage Dwelling of Three Rooms, with various Conveniences*

218. *Accommodation.* There is a good deal of convenience and comfort about this cottage, and it must be allowed to be, externally, rather an elegant object. It contains an entrance under a handsome recess to a lobby, *a*, which opens, on the left hand, into a sitting-room, *b*, with a bed-closet, *i*, and, on the right, into the family bed-room, *d*. Directly in front is the kitchen, *c*; the back kitchen, *e*; dairy, *f*; place for fuel, *g*; privy, *h*; and place for poultry, or a cow, *k*. Where there is a small yard for a cow, poultry, fuel, &c., the apartment, *k*, may be enlarged, and turned into a green-house, heated by hot water from the back of the fireplace in the kitchen, *c*; and *d*, being changed into a sitting-room, may be connected, by double glass doors, with the green-house.

195



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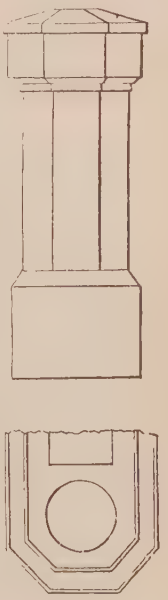


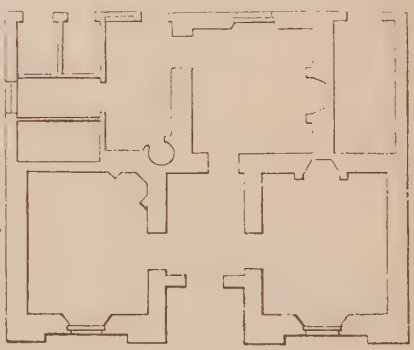
219. *Construction.* This building is well designed for having the walls executed in compressed earth, because these walls are thick, have few openings, and the dwelling is only one story high. The roof is of a low pitch, and should therefore be covered with some description of slate, tile, or metal, and not by any kind of thatch. Beneath the floors may be flues heated from a fire under the boiler in the back kitchen. The windows are shown in the French style, shutting by an air-tight joint, as exhibited in § 196, fig. 177. The panelled pilasters on each side of the door, and at the angles, a cross section of which is given in fig. 195, to a scale of half an inch to a foot, may be finished in plaster or cement. Fig. 196 shows the plan and elevation of one end of the chimney stack, which may be executed in brick-work, and covered with cement.

220. *General Estimate.* Cubic contents, 14,212 feet, at 6*d.* per foot, £355 : 6*s.*; at 4*d*, £236 : 17*s* : 4*d.*; and at 3*d.*, £177 : 13*s.*

221. *Remarks.* The entrance front of this cottage is satisfactory, but the outline of the

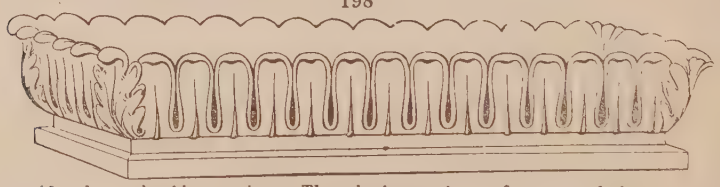
ground plan is by no means so. For what purpose are so many breaks and angles made, when a plain square, as in fig. 197, would have given the same accommodation, with increased dimensions, and at less expense? The answer from the designer will probably be that the breaks are made to produce shade and variety in the elevation, as well as to mark the subordinate parts of the building, in order that an excuse may appear for their being executed in a cheaper manner than the rest. With respect to the first reason, we allow that some perpendicular shadows are by these means obtained; but no shadows whatever will, in our eyes, justify so direct a deviation from the principle of utility. Here are no fewer than five apartments or appendages diminished in size for the sake of getting four breaks and four perpendicular shadows. Surely this will not bear the test of reason. But it may be said by the author of this Design, that the breaks are made to show that what is included in them are appendages or offices, and that they afford a reason why these appendages or offices are placed under lean-to roofs, and have smaller windows, and thinner and lower walls, than those of the main body of the house. Here we admit the architect has reason on his side; for economy in building a cottage must ever be an important object, and indeed seems implied in the very name. The question, therefore, between the designer and us is, whether the superior simplicity and dignity of the exterior elevation that will be produced by avoiding the breaks, and having the walls and roof of the offices of the same height and character as the main body of the building, will not compensate for the additional expense incurred? We think it will; for nothing, in our eyes, adds more to the dignity of a house, than a general simplicity of form, communicating grandeur to it as a whole, and giving an elevated character to its appendages. By comparing the ground plan in Design XXIX. with fig. 197, the superior degree of simplicity of the latter figure, one would think alone sufficient to give it the preference over the other.

197



222. *Improvement.* A very suitable parapet for the terrace of this cottage might be formed by placing mignionette troughs of Austin's artificial stone, or of Peake's Staffordshire ware, such as fig. 198, on the top of a four-inch brick wall, formed of open or pigeon-hole brick-work, and carried to the height of eighteen or twenty inches. At the corner of this wall, solid square piers might be built, covered with plaster, and panelled like the pilasters at the end of the house, and these might be terminated by square mignionette boxes, fig. 199. This done, and corresponding terminations given to the chimneys, the design may then

198



be considered as tolerably complete. The mignionette boxes for mere admirers of flowers and lovers of sweet smells, may be filled with earth, and sown or planted with mignionette; but for botanical amateurs, they may be filled with alpines, or herbaceous plants in small pots. To a botanist, even if he had no other resource than the native plants of Britain, this would afford a perpetual source of enjoyment; because the length of the four sides of the parapet being one hundred and sixty feet, the oblong and square troughs would contain six hundred and eighty pots of three inches in diameter, and of course as many species. These might be changed, arranged, and re-arranged, at pleasure.

199

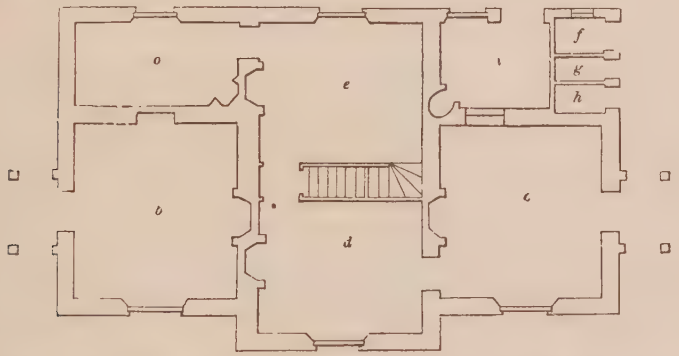
Design XXX.—*A Cottage Dwelling with Five Rooms and various Conveniences.*

223. *Accommodation.* This may be considered a commodious cottage; and it might even be turned into two dwellings, by shutting up the door by which *c* communicates with *e*. The details of the ground floor are two open porches, *a, a;* a shop, or business room, *b;* a principal kitchen or living-room, *c;* two bed-rooms on the ground floor, *d* and *e;* dusthole, *f;* place for fuel, *g;* privy, *h;* back kitchen, *i;* pantry, *k;* and staircase, with closet under, *l*. The chamber floor contains two good bed-rooms, *m* and *n*, each with two small closets. We may observe here, that closets in the outer walls of bed-rooms are very apt to become damp; and that, in general, it is much better to keep clean clothes in wooden presses, commodes, or chests, and dirty clothes in bags. By these modes of keeping, also, less danger is incurred from the moth.

224. *Construction.* The walls may be of earth, of flints, or of bricks built hollow. All the floors may be heated by a flue from the back kitchen, *i*. Two plain mouldings are introduced in the principal body of the front, which will be easily understood from the cross section, fig. 200, to a scale of three-eighths of an inch to a foot. The projection over this ornament contains a sunk panel, the effect of which, as an architrave to the perpendicular mouldings, is satisfactory. The eaves of the roof ought to have gutters, as shown in the section, fig. 36, § 69; and the water may be conducted to a filtering tank under the pantry, from which it may be drawn up for use by one of Siebe's pumps. The roof may be of thatch.

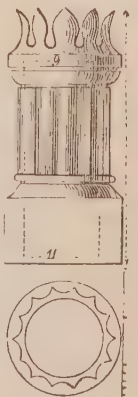
200

201



225. *General Estimate.* Cubic contents, 20,762 feet, at 6*d*. per foot, £511 : 1*s*.; at 4*d*., £340 : 15*s*.; and at 3*d*., £255 : 10*s* : 6*d*.

202



226. *Remarks.* The simplicity of this Design must, we should think, be generally pleasing. The ample sized windows, with their large panes, give the idea of abundance of light and of cheerfulness within; and the circumstance of their being brought down to the floor, shows that elegance has not been lost sight of. Such a building would answer well for a bachelor who had a man and his wife as servants. The former might live in *b* and *e*, removing the bed from the latter room, and sleeping in *m* or *n*. The servant and his wife could sleep in *d*. The apartment, *e*, being made the dining-room, it would be requisite to have double doors between it and the kitchen, in order to exclude noise and smells; and the proximity of these two apartments would be found highly favourable for economising labour, and for what constitutes the essence of all good eating, having things brought to table hot. One little alteration in the plan would be requisite to answer the comfort of all parties, supposing the house turned to this use; and that is, that the staircase, *l*, should enter from *e*, instead of from *d*. This would require no additional expense at the first erection of the house, but merely forethought. Supposing that the master were desirous of having a bed-room on the ground floor, it would only be requisite to join *f*, *g*, and *h*, to *i*, in a new form, and to open a door from *e* to *o*, as in fig. 201. The house would

be greatly improved by this arrangement, and it might be rendered still more commodious by having two steps down to *i*, so as to get a floor over *i*, *f*, *g*, and *h*, in which to form a bed-room for the married servants, to be entered by a stair from *i*. This would allow of *d* being used as a drawing-room. In this way a very simple cottage might, at a very moderate expense, and what is of more consequence, without injury to its beauty or character, be changed into a cottage villa, fit for the residence of any gentleman whatever. It would then deserve some ornament; and what we should prefer would be to surround the whole by a glass veranda, placing a light iron fence on the outer margin of the stone parapet, and ornamental chimney pots, fig. 202, on the stacks of chimneys; or a somewhat different style may be adopted, as in fig. 203.

203

Design XXXI.—*A Dwelling with Five Rooms, with Conveniences, in the Old English Style, where the building material is chiefly Stone.*

227. *Accommodation.* There is more show than space in this building, from the circumstance of there being only one room in width in the bed-room story. It is by no means recommended as a cheap Design, but as one ornamental and characteristic; and suited for producing a great effect, at comparatively little cost, in a country where free-stone, soft and easily worked, is abundant, and the price of labour low. The ground floor consists of an entrance and staircase, *a*; a kitchen, *b*; a wash-house, or back kitchen, *c*; a bed-closet, *d*; a milk-room, *e*; a closet under the stair, *f*; a bed-room, *g*; parlour, *h*; store cellar, *i*; place for coals, *k*; and privy, *l*. The chamber story contains two bed-rooms, *m* and *o*; a dressing closet, *p*; and a staircase and landing, *n*.

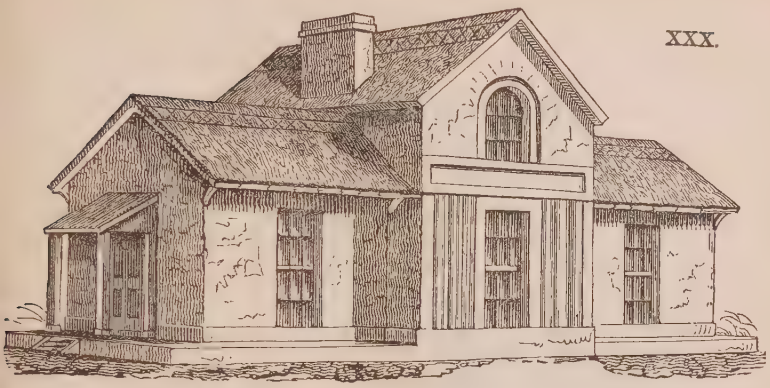
228. *Construction.* The walls should be of stone, in regular courses, or of brick; and the jambs (sides) of the doors and windows, with their sills, and lintels (covering stones) of hewn stone. These may, or may not, be bevelled at the angles. The mode of executing the summer stones and pinnacles, will be understood from figures already given, § 209, figs. 185 and 186. Great care should be taken in constructing the guttering over the bay windows, so as completely to carry off the water. These windows may have mullions, and iron casements made to open. The roof should be slated, and the chimneys may be of stone, and polygonal, or what are commonly called cannon chimneys. The chimney head cornice may be executed as in fig. 204. Some use may be made of the roof, to which light and air may be admitted by the small openings shown in the upper part of the gables.

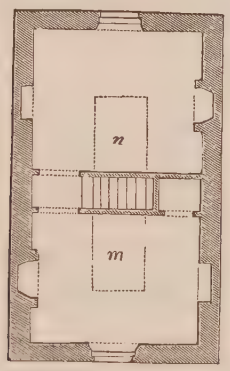
204

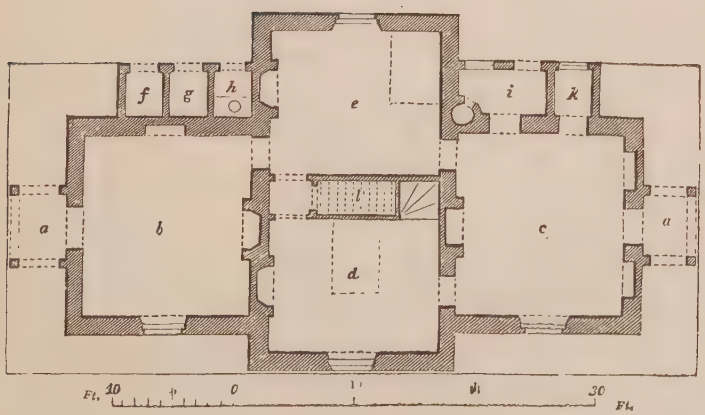
229. *General Estimate.* Cubic contents, 23,024 feet, at 6*d*. per foot, £575 : 12*s*.; at 4*d*., £383 : 14*s* : 8*d*.; and at 3*d*., £287 : 16*s*.

230. *Remarks.* In England, this would be considered a very suitable house for a gardener or bailiff, where effect was an object; and it might be adapted to a small family, in easy circumstances, by rendering *g* a sitting-room; and by raising a floor over *c*, *d*, and *e*, for servant's sleeping-rooms; and another over *i*, *k*, and *l*, for a family bed-room; the dwelling would then be tolerably complete. A light stone parapet may be placed on the outer margin of the platform with ornaments at the corners somewhat analagous to those which terminate the gable ends. These, with the other variations and improvements of which this dwelling is susceptible, we leave to be designed by our readers.

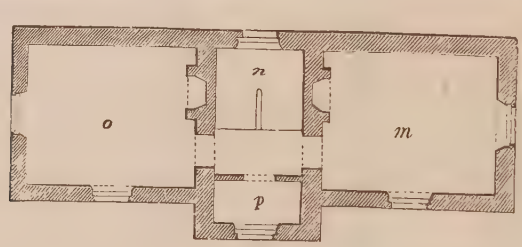
XXX.

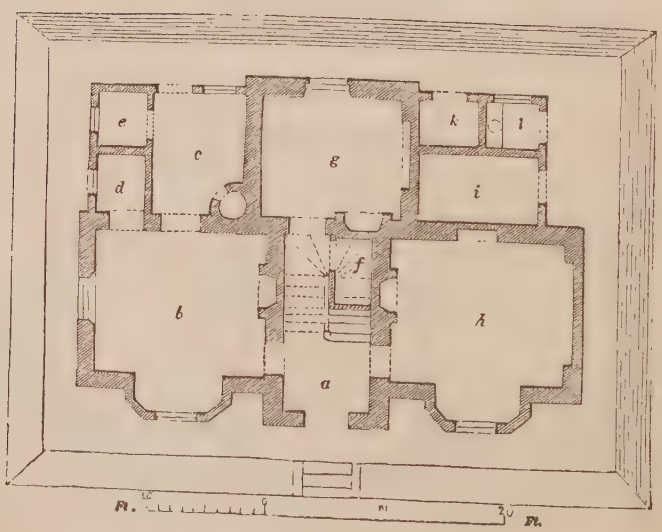






XXXI.





Design XXXII.—*A Cottage Dwelling with Two Sitting Rooms, in a mixed style, where Timber, Brick, and Slate are the materials used for the Walls and Roof.*

231. *Accommodation.* This is a very commodious, convenient, and handsome dwelling; exhibiting every thing requisite for a cottager, whether a gardener, a bailiff, or a small farmer. It contains three floors;—for cellars, for living-rooms, and for bed-rooms. The cellar, or basement story, (see the plate forming page 117), contains a store-cellar, *a*; beer-cellar, *b*; coal-cellar, *c*; salting-room, *d*; and staircase, *e*. These are lighted by windows having sunk areas, *f*. The ground plan of the living-room floor (also in page 117) shews the principal entrance and staircase, *g*; a sitting-room, *h*; another sitting-room, *i*; a staircase, with a closet under it, *k*; a kitchen, *l*; a wash-house, *m*; a pantry, *n*; and a store room, *o*. This floor is surrounded by a terrace, part of which is covered by an extension o the roof of the kitchen and wash-house, as may be seen by inspecting the plates in pages 113 and 114. The chamber floor contains a bed-room, *p*; staircase and landing, *q*; closet, *r*; bed-room, *s*; closet, *t*; closet from the passage, *u*; passage, *v*; family bed-room, *w*; and nursery, or infant children's bed-room, *x*.

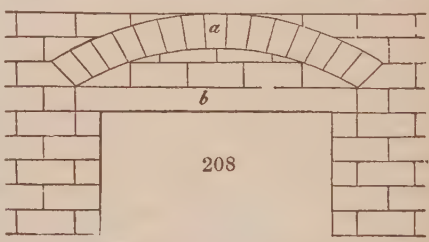
232. *Construction.* The walls are to be of brick; the roof covered with slates; the chimney shafts of cement, or artificial stone; and the balconies, brackets, posts, and gallery railings, of oak timber. The details of construction are given in the plate, forming page 118, in which fig. 1 is the open truncated pediment in front of the house; and shows the ends of the ceiling joists, *a*; the purlins, *b*; the covering of the pediments, *c*, *c*; the wall plate, *d*; and the bracket, *e*. Fig. 2 is a section at the eaves of the roof over the kitchen; in which is seen the rafter, *f*; the wall plate, *g*; the brackets, *h*, *h*; and the cross section of the post, *i*. Fig. 3 is the chimney top, in which is seen the chimney shaft, *k*. Fig. 4 is a cross section, or plan, of the chimney, in which one half, *l*, represents the plan of the base; and the other half, *m*, the plan of the top. Fig. 5 represents the balcony, in which is shewn the corbel, *n*, which supports the bracket, *e*; also the bracket, *o*, which supports the balcony; and the wall of the house, *p*. Fig. 6 shows the gable brackets to support the roof, in which is seen the gable wall of the house, *q*; and the section of the rafters, *r*, *r*. Fig. 7 shows the elevation of the lower part of the post; in which is seen a balluster, *s*, with a section of the upper and under rails. Fig. 8 shows the end elevation of the flower balcony; in which is seen the bracket, *t*, and the section of the wall, *u*. Fig. 9 shows the front elevation of the flower balcony. Fig. 10 is the section at the eaves of the front wall of the house; in which is seen the rafter, *v*; the section of the wall, *w*; and the bracket, *x*. Fig. 11 is the section of the plaster cornice of the sitting rooms, &c. Fig. 12 shows the section of the grounds (ground work, or foundation plan) for forming the architraves round the doors, windows, &c.; in which is seen the ground, *y*; and the jamb lining, *z*.

233. *Particulars, or Specification and Estimate.* The contributor of this very elegant and judicious Design, has sent with it a no less copious and complete specification and estimate. We consider the former, together with its accompanying explanations of technical terms, of the greatest value to the young architect, and the amateur. To the general reader, they will show the manner in which business is done among architects and builders, and their employers in England. A Design being once agreed on, details similar to those in the following specification, are first made out by the architect; and then the builder, who contracts for the work (either at the estimate made by the architect, or at one made by himself, after having had the plans and specification some days in his possession for that purpose), signs this particular, or specification; and also an agreement made out, according to certain legal forms. This agreement binds him to execute the work, under a certain penalty, according to the specification, and to the satisfaction of the architect, or of a surveyor (for a surveyor, as clerk of the works, is often employed in addition to the architect). Security for the execution of the work is also sometimes required of the builder; in which case, the guarantee also signs the agreement, or a bond for the amount of the penalty. The particular, or specification sent by our contributor, Mr. Richard Varden, as a fair specimen of the usual style, bears the following title:—"PARTICULARS of the several works to be done in building a cottage residence, according to the annexed plans, elevations, sections, and details, and the conditions subjoined." The work is classed according to the trades employed to execute it; and we shall give the specification, for each trade, in a separate paragraph. We may observe here, that the specifications and estimates of architects, surveyors, and builders, are frequently composed in a sort of professional, or abbreviated style, which, independently of its technical terms, is unintelligible to general readers from want of care in its grammatical construction The terms are unavoidable; but the employers of professional men should insist on at least readable language. Another point which we

should always require would be perspective views, undisguised by trees, or gaudy colouring, of the edifice to be erected, independently of the necessary geometrical plans, sections, and elevations; and in works of importance, a model in unpainted wood should always be constructed, and maturely considered before a Design is determined upon.

234. *Specification of Excavator's, Well-Digger's, and Bricklayer's Work.* To dig out the earth for the basement story, together with the cesspools and drains, and the several trenches for the foundations of the whole of the building, of the respective depths and widths required; and to fill in and well ram the earth round the work. The surplus earth arising from these excavations, and from the well, together with the rubbish made in the progress of the work, to be spread round the house so as to form the terrace, shewn in the Designs (if more earth is required for this purpose, it must be brought to the spot at the expense of the employer); and the whole to be well rammed and consolidated.—To dig a well four feet clear in diameter, and forty-five deep, and to steen the same in four-inch brick-work, with the top properly domed over in nine-inch brick-work; leaving a manhole, twenty inches square, covered with a Yorkshire stone, having a strong iron ring on the top. If a greater depth than forty-five feet should be required, the additions must be paid for by the employer as an extra; and, if a less depth is sufficient, a proportionate deduction must be made. To dig a cesspool four feet clear in diameter, and nine feet deep, and steen it with four-inch brick-work; leaving a manhole, which is to be closed with a Yorkshire stone, the same as that used to close the well. All the bricks to be used in the building, or brought upon the premises, to be sound and good well burnt grey stocks (bricks made of marley clay; that is, clay having a certain proportion of marl naturally, or chalk artificially, mixed with it); those to be used in the external parts of the building to be carefully picked of an uniform colour; and the whole laid, and flushed solid (the joints filled up) in mortar, of the several heights and thicknesses, with the apertures specified in the drawings: none of the bricks to be brought upon the premises to be slack burnt (imperfectly burned), or overburnt. The mortar to be composed of the best well burnt grey lime (grey lime-stone, not chalk lime-stone), and clean, sharp, pit, or river sand, well tempered together; and to be sifted through a screen, whose wires shall be at equal distances, and not less than thirty in every foot in breadth.—The walls of the foundations and cellars, up to the level of the platform, to be worked in brick-work, and grouted (fluid mortar poured into the middle joints) with hot lime and sand; the rest of the walls above ground to be of brick-work, and the external face to be worked with a neat flat ruled joint (a ruled joint is a joint struck flat with the trowel, with a line drawn in the centre by means of a small iron instrument, fig. 207, called a jointer, and an iron straight edge, or flat ruler). The terrace wall to be built battering (sloping inwards), from two feet three inches at bottom, to nine inches thick at top, with a nine-inch upright parapet, coped with bevelled bricks, and fourteen-inch brick piers, as shewn by the drawings; fourteen common garden pots and pans, twenty inches high, to be provided and fixed thereon. Four-inch brick discharging arches (arches built over lintels to relieve them from part of the superincumbent weight, fig. 208, in which is shown the discharging arch, *a*, and the lintel which it is intended to relieve, *b*), to be turned over all the openings in the interior of the walls; twelve-inch guaged arches (bricks reduced by rubbing on free-stone laid on a table, called a banker, to the shape of truncated wedges, so as to form arch stones, fitting exactly with each other, according to the curve of the arch; the faces of these bricks are also rubbed quite smooth), with eight-inch skewbacks (the space between *c* and *d*, in the guaged arch, fig. 209, is the skewback of that arch), and four-inch soffits (the under side of the arches) corresponding in width with the reveals (the outside jambs, or rabbets; see *q*, in fig. 180), to be put over all the external openings, made of the best grey cutting bricks.

207



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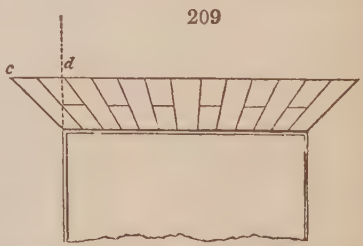

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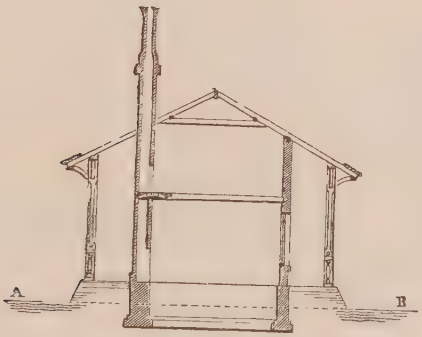

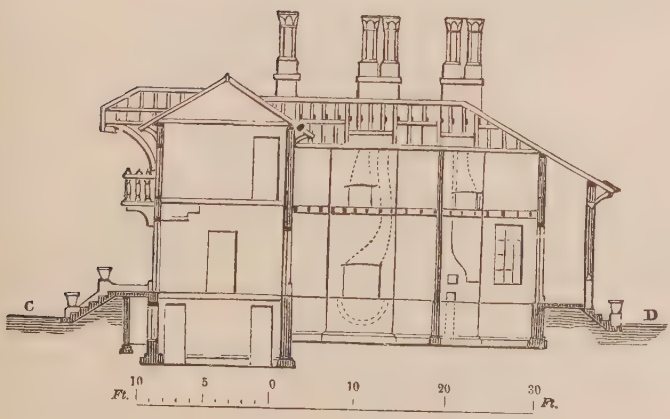

Q

XXXII.

Front elevation.

Side elevation.

Back elevation.

Nine-inch brick inverted arches, fig. 210 (*f g* being the level of the ground, and *h* the window or opening over the arch), are to be turned, the whole thickness of the walls, under all the external openings and chimney jambs. Inverted arches are intended to equalise the pressure of the foundations on the earth, and thus to prevent the sinking of one part more than another, or what are called settlements: it is evident that whatever carries down *i i*, fig. 210 must also carry down the point *k*. The chimney hearths, jambs (see § 79. fig. 47.), backs, breasts, and shafts, to be of brickwork. All the flues to be fourteen inches square in the clear, properly gathered (drawn in above the fireplace, till they are reduced to the proper size), and pargeted (plastered with mortar, mixed with cowdung); and each flue to have a Roman cement chimney shaft (as shown by figs. 3 and 4, in the plate of details, page 118,) flanched up (sloped in a way to throw off wet: in fig. 211, *l* is a section of the chimney shaft; *m*, a section of the flue; and *n n*, sections of the flanchings) with plain tiles set and rendered (plastered) in cement.

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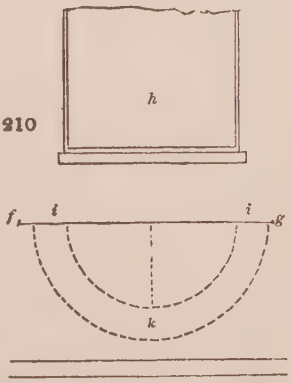

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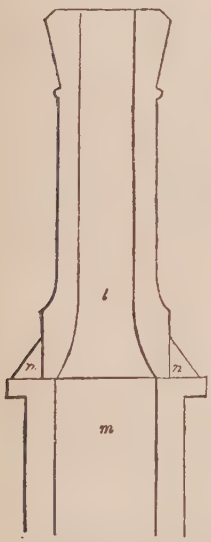

A strong iron chimney bar (fig. 212, *o o*: in this figure, *p* is the breast; *q q* are the jambs; *r*, the inverted arch under them; and *s*, the footing, or first course of the foundations), to be put to each of the fireplaces; and four-inch brick trimmer arches to be turned where required. (Trimmer arches are made to support the hearthstones, abutting at one extremity on the wall of the chimney, and at the other on trimming pieces. Trimmers are pieces of timber framed at right angles to the joists, against the ways (openings) for chimneys, and round the well-holes (openings left in floors for admitting the stair) of stairs, &c. Fig. 213 is a plan in which are seen the joists, *t t*; the trimming piece, *u*; and the fireplace, *v*. Fig. 214 is a section of the same plan, in

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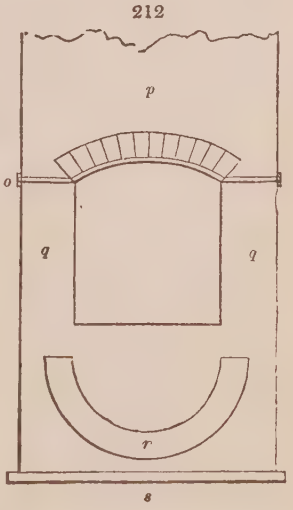

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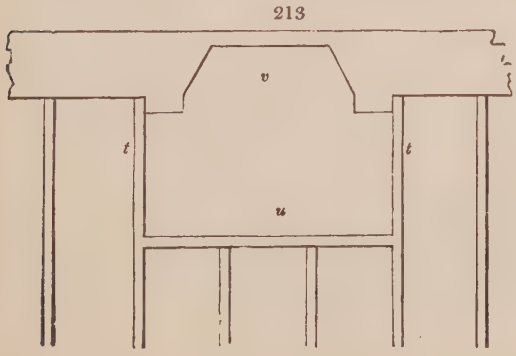

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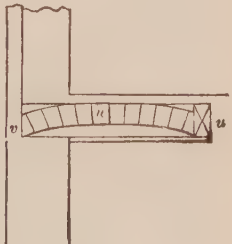

which the trimmer arch, *w*, is shown abutting against the trimming piece, *u*, and the back of the chimney, *v*.) To build brick foundations for the sink, and for the stone steps; and nine-inch brickwork to surround the areas in front of the basement windows, coped with brick on edge set in Roman cement, and paved with bricks, having sink holes and drains, to deliver the water into the main drain. To put 100 feet of hollow tile drain, twelve inches clear in the bore, where directed; and to lay the whole of the drains with a proper fall, and at a sufficient depth to deliver the water away from the lowest part of the building. To provide nine cast-iron stink-traps eight inches square, and fix one at each external aperture of the drain. (The construction and action of a stink-trap will be easily understood from the section, fig. 215. Water falling into this trap, through the cover, *x*, escapes by the funnel, *y*, the inverted semicircle over which prevents all air from ascending. See figs. 222, 223, and 224. The terrace to be paved with pebbles laid in sand, properly currented, and well rammed. To build foundations and enclosure walls, and an oven three feet six inches by three feet in the clear, properly domed, plastered, and paved; and to find and fix the requisite iron work for the same, such as an iron door and frame, hinges, latches, &c., complete. To fill in the nogging partitions with brick nogging flat (brick on bed). To pave the wash-house, pantry, and store room, with dressed paving bricks (smoothed on one side by passing a cylindrical rule, wetted, over the soft brick when moulded); the kitchen to be paved with ten-inch tiles, bedded and jointed in mortar; and the rest of the basement story, throughout, with common stock bricks laid flat in sand: the whole to be properly levelled and currented to the several drains. The openings of the fireplaces, in the sitting-rooms and in the chambers, to be three feet high by their respective widths; and that of the kitchen to be four feet high. All the window and door frames to be properly bedded and pointed in good lime and hair mortar, and the sills underpinned. (When stone sills are built into any wall, they are generally made to bear on solid work only in those parts directly above which the wall is carried up. The reason is, that, in buildings of any height, the solid parts are apt to sink a slight degree more than those parts in which there are several openings one above another. Thus, in the sill, fig. 216, *a* and *b* represent those parts of the sill on which the jambs of the doors or windows are carried up. Now, if the sill were bedded on solid walling throughout, from *a* to *b*, and especially towards *c*, it is evident that, if the walling sunk only half an inch at either *a* or *b*, not having the same superincumbent pressure, it would not sink to the same degree at *c*, and the consequence would be a rent in the stone at *d*. For this reason sills are left hollow between the two points of bearing, until the walling is completed; and the filling up of the hollows after is called the underpinning. In brick buildings, the sills, whether of stone or oak, are not generally put in until the walls are carried up to their destined height, and they are then let in by cutting away part of the brickwork from the jambs.) The bricklayer is to find scaffolding for the use of the carpenter, slater, plasterer, and other trades requiring the use thereof for the outside work; and to allow the same to remain until the external part of the building shall be completed. The walls are to be carried up in an upright, substantial, workmanlike manner; and, in the progress of the building, no part is to be raised more than four feet above the other (in order that the whole may settle, or sink equally, and at the same time), except in gables and chimney-shafts; and the whole is to be built in a regular and equal manner. To fix the wooden bricks, and to bed all the plates, bond timbers, lintels, &c., in loam. To cut all the rakes and splays, and all the chasings required for the lead flashings (strips of lead to cover joints or joinings), and to make good and stop the same with Roman cement. To do all the wind-pinnings (filling in the angle between the wall-plate and the roof) and beam-filling (filling up with brickwork the interstices in the wall, between the ends of the beams) required. The bricklayer is to find all the materials, ropes, ladders, boards, tackle, tools, workmanship, and ironwork, for the completion of his work, and for the carriage thereof; and to do the

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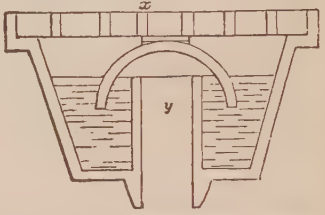

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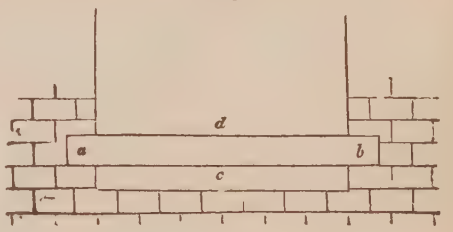

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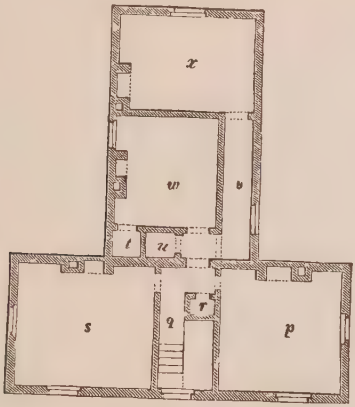

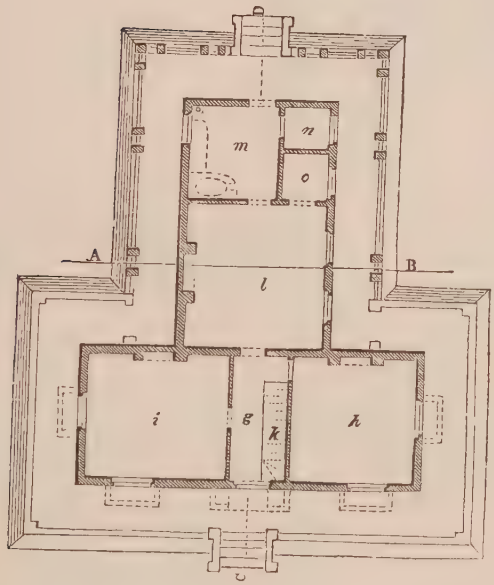

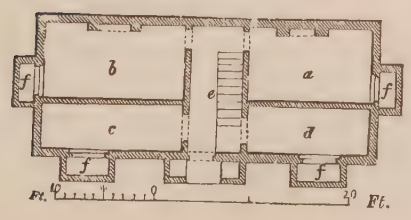

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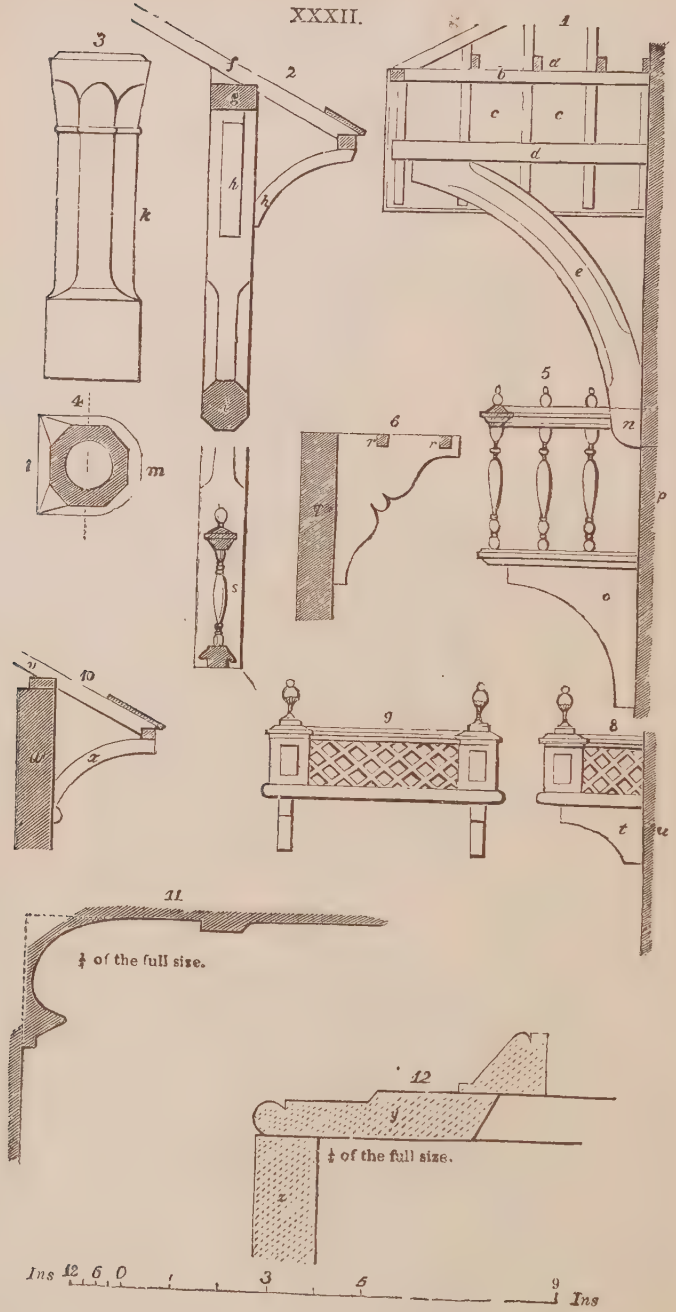
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whole in the best and most workmanlike manner, subject to the general particulars at the end of this specification.

235. *Specification of Plasterer's Work.* The cement chimney shafts to be coloured twice over, of a good warm stone tint. To lath, lay, float, set, and white the strings of the principal stairs, and the ceilings of the sitting-rooms, of the passage, and of the chamber floor throughout. The ceilings of the kitchen, wash-house, pantry, store-room, and the whole of the basement story, as well as the pediment in front of the house, to be lath-laid, set, and whited. (To lath, plaster, float, and set, is to give what is called three-coat work; the first coat, given after nailing on the lath, is called pricking up; the second, floating; and the third, setting or giving a coat of fine stuff. The second coat is called floating, from the tool used in the operation, which is denominated a float. There are three sorts of these tools; viz., the hand float, the quirk float, and the Derby or two-handed float. The floated coat is brushed with a birch broom, to roughen the surface before the setting coat is applied. The first coat of two-coat work is called laying, when on lath, and rendering on brick. In three-coat work, the first coat on lath is called pricking up, and upon brick roughing in.) To lime white, twice over, the walls of wash-house, and the basement throughout. To lath, plaster, float, and set, for paper or colouring, the whole of the battening (pieces of wood fixed to the bond timber on the walls at regular distances, on which the lath is to be nailed) of the inside of the external walls, and partitions for lath of the principal and chamber floors (except the wash-house); and render-float (roughing in would be the more correct term here, but rendering is generally used, and is understood by the trade), and set, for paper or colouring, all the internal walls, and nogging partitions of both floors. All the external walls, with the exception of the wash-house, will be battened by the carpenter. All the timbers in the partitions, and the bond (the timber built into the walls), to be diagonally lathed. (Lathing diagonally lessens the risk of cracks in the plaster, in case the timber should shrink). The two sitting-rooms and passage to have plaster cornices, as shown in fig. 11, in the plate of details, page 118. The plasterer is to find all materials, tools, trestles (a sort of stool, sometimes five or six feet high, fig. 217, used for supporting scaffolding boards), boards, moulds, rules, carriage, and workmanship required for the completion of his work; and to run (a term used by plasterers, meaning to form) such beads, quirks, arrises (projecting angles), &c., as may be necessary for the perfect execution of the same; and to do the whole in the best and most workmanlike manner, subject to the general particular at the end of this specification.

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236. *Specification of Slater's Work.* To cover the whole of the roofing with the best countess slates, nailed with stout wrought-copper nails; the eaves to be laid double, and the whole of the slates to have a sufficient overlap, and to be carefully sorted in courses consisting of slates of equal thickness, so as to exclude the weather effectually. The slater is to find all materials, tools, carriage, and workmanship required for the completion of the above; and to do the same in the best and most workmanlike manner, subject to the general particular at the end of this specification.

237. *Specification of Stone-Mason's Work.* All the windows to have York quarry stone sills, eight inches wide, beveled, throated (in the section of the stone sills, fig. 218, the throat is represented at *e*; *f* is the bevel of the sill, and *g* the oak sill of the window frame, resting on the stone sill; and also throated at *h*), and tooled (see § 82). The entrance door to have a landing (a piece of pavement of larger dimensions than ordinary) over the area, of Yorkshire stone, four inches thick, rounded at the edges; the terrace to have Yorkshire pavement laid the width of the stairs at the entrances; the steps and the coping of the spandril (the space between an arch and the member over it), together with the coping of the piers (the solid parts between any arches or openings) of the stairs, and those on the terrace wall, to be of York quarry stone. The coping of the spandrils to be twelve inches wide, and that of the piers seventeen and a half inches square, properly cramped and run with lead. Each parlour to have vein marble profile chimney-pieces, not exceeding seven pounds in value, exclusive of hearths and slabs. (Profile chimney-pieces are such as have projecting jambs, with their sides covered by slips,

218

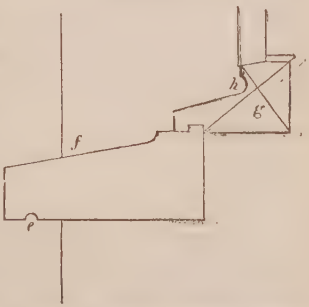
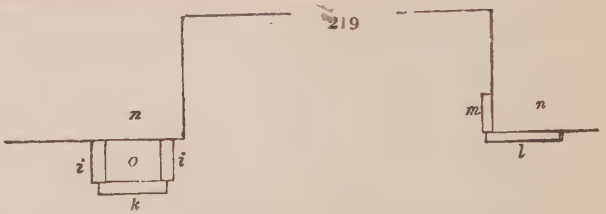


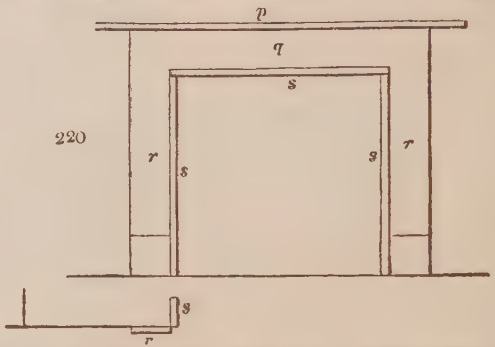
fig. 219, *i i*, of marble, stone, or whatever material the chimney-piece may consist of When there are two side slips, *i i*, and a slip in front, *k*, the chimney-piece is said to be in profile; when there is only one piece in front, it is said to be not in profile, and the front slip, *l*, is called a jamb.

219



Such chimneys have generally an inside slip, *m*; but this rests against the brick jamb of the fireplace, *n*, instead of the stone jamb, *o*, to which the slips of the chimney-piece are fixed. Fig. 220 is an elevation of a chamber fireplace

220



chimney, in which *p* is the shelf; *q*, the mantel; *r r*, the jambs; and *s s*, the inside slips.) All the fireplaces to have Yorkshire stone hearths, and Portland stone slabs. The fireplaces of the front chambers to have plain Portland stone mantels, jambs, slips, and shelves with rounded corners. The kitchen to have one inch and three quarters thick Portland stone mantel and jambs. The kitchen, pantry, and store-room to have milled slate (milled slate is sawed out of blocks by machinery; roofing slate is cleft into laminæ by wedges) skirting (a bordering to the wall) seven inches high, and one inch and a quarter thick, properly cramped (by an iron or copper hook, fig. 221, driven into the wall at one end, and let

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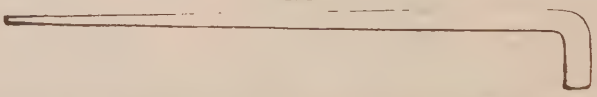
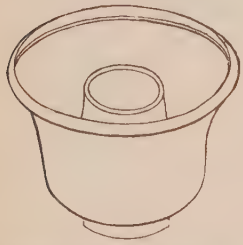


into the slate at the other), backed up, and set in Roman cement. The wash-house to have a Yorkshire stone sink, five feet long and two feet three inches wide, with a proper hole for the bell-trap (a kind of stink-trap usually made of bell metal, about three inches across and round, figs. 222, 223, and 224). The mason is to find all cramps, lead, and

222



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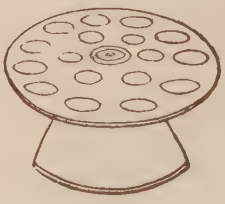

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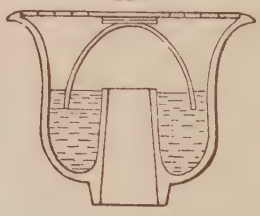
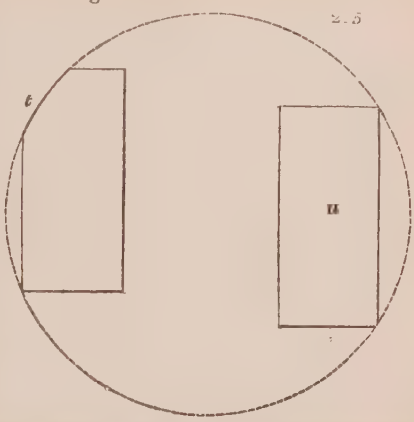


all the materials, as well as the carriage and workmanship required for the completion of the above; and to do the same in the best, most substantial and workmanlike manner, subject to the conditions of the general particulars.

238. *Specification of Carpenter's Work.* The whole of the bearing timbers to be sound, well seasoned, yellow Dantzic or Memel fir timber, except where otherwise specified. The whole of the carpentry to be framed in a workmanlike manner; and all the timber to be sawed square, and to be free from sap (outside wood, not properly matured), wanes

(deficiencies, as at *t*, in fig. 225, owing to marking the dimension too near the circumference, instead of making allowance for the sap wood, as at *u*), shakes (fissures in the wood), large knots, or other defects, and of the several dimensions, scantlings, and descriptions, which follow; and all the carpenter's as well as the joiner's work, to hold the several scantlings (the term scantling is generally applied by carpenters to the depth and width of a piece of timber) and thicknesses when finished, such which are named in the particulars: this must be particularly attended to. The principal and chamber stories to have two tiers of oak bond, three inches by two inches and a half, to pass through the openings, and not to be cut out until the work has become settled; and an oak wall-plate under each floor, four and a half inches by three inches, dovetailed at the angles, and halved and spiked at the laps. To put double oak lintels four inches thick, and of the width of the respective walls, except the reveals (properly revels, from *revelo*, to reveal or discover; the two vertical sides of the aperture between the outside front of the wall and the window), and to rest nine inches on the walls at each end. Wooden bricks of oak (see § 83), to be furnished to the bricklayer to be inserted in the jambs, not exceeding two feet apart, for fixing the linings to, where necessary. The entrance passage and the two sitting-rooms to have heart of oak joists six inches by four inches. The chamber floors to have fir joists nine inches by two inches and a half, not more than twelve inches apart; and trimmed (see § 234, and fig. 213), to the stairs and fireplaces, with trimmers and trimming joists nine inches by three inches and a half, with one inch and a quarter yellow deal keys (pieces of timber driven fast between each pair of joists, with their ends butting against the groin of the joists; they are commonly called strutting pieces, and their use is to stiffen the floor), in each chamber. The back chambers and passage to have ceiling joists four inches by two inches, and thirteen inches apart, firmly spiked to the common rafters, as shown by the drawings. The front rooms to have ceiling joists four inches by two inches, not more than twelve inches apart, and framed into the tie beams. The penthouse (a roof projected from a wall, and not supported by pillars) in front, to have ceiling joists three inches and a half by two inches, spiked to the rafters above the purlin. — Roof. Tie beams (see fig. 54 to be seven inches by four inches; framed principal rafters six inches by two inches and a half at bottom, and four inches by two inches and a half at top; purlins, five inches by three inches, to be framed to the principals; wall-plates, five inches by two inches and a half; pole-plates, four inches by two inches, supported by wrought curved brackets four inches and a half by four inches, as shown by the drawings; common rafters to be four inches by two inches, not more than thirteen inches apart, and properly trimmed to the shafts. The feet of the rafters which project beyond the brickwork are to be five inches by three inches and a half, wrought, notched, and spiked to the wall-plate and pole-plates. The roofing of the back part will be without principals or tie beams. The roof throughout to have one inch and a half yellow deal hips, nine inches wide; and ridge pieces of the same width and thickness, rounded off for the lead; the valleys to have one inch thick feather-edged flanch boards nine inches wide. (Hips and valleys are formed wherever roofing meets at a right or other angle; the external angles, fig. 226, *a a a*, form the hips; the internal angle, *b*, the valley; *c c*, the ridge; *d*, the gable; *e e e*, the eaves; *f*, the span; and *g*, in fig. 227, which shows a double



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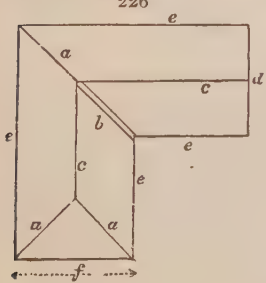

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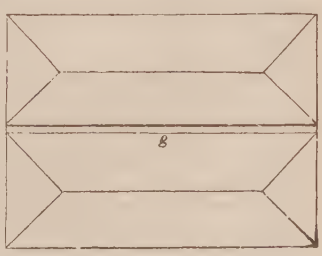
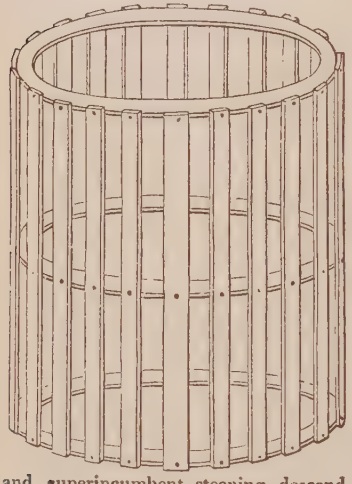


roof, the gutter between the roofs.) The chimney shafts to have one inch gutter boards and bearers, with feather-edged flanch boards nine inches wide; the eaves to have one inch and a quarter thick feather-edged eave boards, with wrought and rounded edge, and a wrought fillet between the pole-plate and eave boards, nailed to the feet of the rafters: three-inch thick cut brackets to be put under the projection of the roof over the gables (as shown by fig. 6, in the plate of details, page 118). The rafters of the roof to be covered with three quarters of an inch thick deal slips two inches and a half wide, for countess slating, with such tilting fillets (see fig. 55), &c., as may be required. The penthouse in front to have wrought and curved chamfered (the angles planed off, as in fig. 228, in which *h* is the chamfer) brackets six inches by ten inches, to support the plate, as shown by the drawings, firmly fixed at the lower end into the wall. Partitions for brick nogging flat (see fig. 58) to have heads and sills four inches by two inches; puncheons (quarters) and braces, four inches by two inches and a quarter, and eighteen inches apart; door-posts and principal quarters, four inches by three inches; nogging pieces, four inches by two inches. Partitions for lath to have heads and sills, four inches and a quarter by three inches; common quarters, three inches by two inches and a quarter, and twelve inches apart; braces, three inches by two inches and a quarter; door-posts and principal quarters, four inches by three inches. The whole of the external walls of the principal and chamber floors, except those of the wash-house, to be battened inside with one-inch thick yellow deal battens, two inches and a quarter wide, and twelve inches apart. The well to have a proper barrel curb, four feet high, boarded with one-inch thick boards, and oak stages to be placed in the well for fixing the suction pipe of the pump. (A barrel curb is formed of circular ribs, generally of elm, on the outside of which slips of deal, four feet long, are nailed so as to form a cylinder, fig. 229, on which the brick steening is placed; the rest of the steening is built above it, as at *i*, in fig. 230; and, as the well is sunk, the curb

228

229



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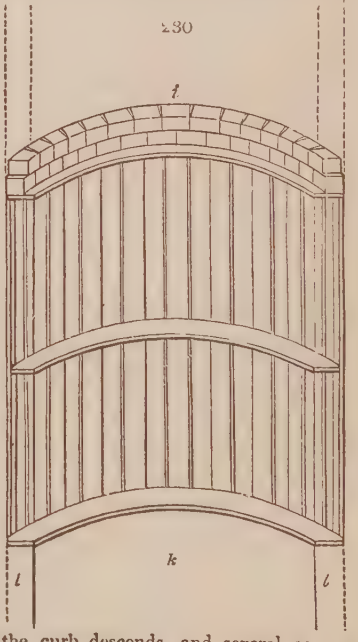
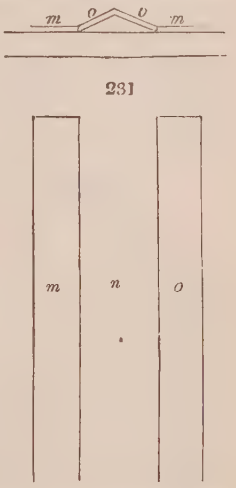


and superincumbent steening descend. When the well is in progress, the body of the earth, *k*, is dug out to the depth of two or three feet at a time, according as the soil may be more or less tenacious, and drawn to the surface in buckets; a band or rim, *l l*, being left under the curb; this band is afterwards dug out, when the curb descends, and several courses of steening are added above. The use of the curb is to keep the well perpendicular, and truly cylindrical during the work; it is left in the well, the interstices between the slips being filled in with brickwork. Oak stages are pieces of timber, with their ends fixed in the steening, which cross the centre of the well, at the distance of eight or ten feet from the bottom, and from each other; to these the pipe of the pump is fixed, in order that they may support its weight, and keep it steady.) The carpenter to make, fix, and refix, when required, such centring (frames of timber by which the brick or stone work

of arched vaulting is supported during its erection) as may be necessary for the bricklayer's or well-digger's use, in forming arches, trimmers, &c.

239. *Specification of Joiner's Work.* All the timber used by the joiner to be the best well-seasoned yellow deal listed (listing is cutting off a strip of such boards as are blue and sappy at the edges, so as to leave only the true wood), free from sap, shakes, and large or loose knots. The whole to be neatly wrought, framed, and finished off (rubbed after being planed) with firestone (a kind of soft stone, which serves to smooth the surface), in the most substantial and workmanlike manner. — Floors. To lay good one-inch thick yellow deal straight-jointed floors in the sitting-rooms and passage; and one-inch thick yellow deal folding floors throughout the chamber story. (The term folding is applied to a peculiar manner of laying floors. The first and fourth boards are bradded down (tacked, or slightly nailed; from brad, a small nail made without a head, so that the nail may be sunk into the wood), with an intervening space, *n*, fig. 231, something less than the breadth of the two boards, *o o*, that are to go between; so that when these two last are placed with their edges coinciding with the edges of those fixed, as shown by the section, *m o o m*, they rest, as it were, *folded* together in the middle, forming a ridge; on which ridge two or more workmen jump, till they force the boards down flat between the other two, they are then secured with brads. The object of this process is to procure very close joints.) The whole of the rooms to have proper borders (narrow slips forming a margin) to the hearth slabs, &c. — Doors of Chamber Floor. To put one inch and a quarter thick four-paneled doors throughout this story, framed square on both sides, and hung with two inch and a quarter butt hinges (see fig. 65); and to have good iron rim locks, with plain brass knob furniture, one inch and a quarter single-rebated jambs (in fig. 232, *p* is the jamb, *q* the door, and *r* the rebate), with one-inch framed wrought and sunk grounds, five inches wide, and with quirk ovolo and fillets laid on to form the architraves. — Doors of Ground Floor. The doors opening into the entrance passage to be one inch and a half thick, six-paneled, and hung with three inch and a half butt hinges; having good mortised locks (locks which are inserted in a mortise, cut edgewise into the style of the door), with plain brass knob furniture; one inch and a quarter deal single-rebated jamb linings, with grounds (see fig. 12, in page 118) and mouldings the same as those of the doors of the chamber floor. The doors that open into the sitting-rooms to be moulded inside. The door at the top of the cellar stair, together with all the other internal doors on the ground story, that have not been specified, to be finished in the same manner as those of the chamber floor. The front entrance to have a two-inch deal sash door; one inch and a quarter astragal and hollow sash bar, fig. 233 (fig. 234 is an ovolo sash bar), circular-headed, with double-margined and diminished styles, hung with three inch and a half butt hinges, and provided with two six-inch bright rod-bolts (see fig. 68), and a ten-inch iron rim drawback lock (having a bolt which draws back from the inside by means of a knob), with brass knobs; the bottom of the door to be framed with three reeds, flush on one side, and square on the back, one-inch thick clamped lifting shutters, with studs and plates and screw fastenings, and one inch and a half rebated jamb linings and grounds, with mouldings to match the others. (Double-margined and diminished styles will be understood from fig. 235; in which, *s* is the style of its full breadth; *t* the style diminished; *u* the inner margin, for the purpose of receiving the shutter; *v* the sash; and *w* the panel. The section of the diminished style is shown at *x*, and the shutter by the dotted lines, *y*.) The back entrance door to be one inch and three quarters thick, six-pa-



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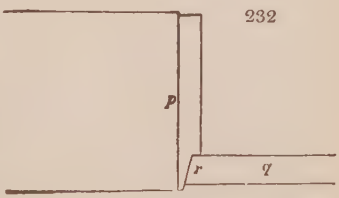

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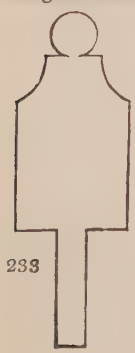
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neled, square on both sides; and to be hung and fitted as the front entrance door, with jambs, lining, &c., to correspond: both of the entrance doors to have oak-framed door cases and sills, five inches by three inches and a half. — Basement. The basement story to have one-inch thick deal proper-ledged doors (a ledged door is called proper, when it is wrought, ploughed (grooved), tongued (slips which go into the grooves, so as to make perfect joints), and bedded), and good oak proper door-cases, five inches by three inches and a half, (a door-case is called proper, when it is wrought, framed, rebated, and beaded), hung with eighteen-inch cross garnet linings, with stock locks (see fig. 69.), and Norfolk latches (see fig. 67). The basement story to have solid oak proper two-light window frames, four inches by two inches and a half, with one-inch iron stanchion bars (properly, supporting bars, but here placed for protection), four inches apart, wrought-iron casements, and strong hinges, latches, stay irons (fig. 236), saddle-bars (cross-bars to which the leadwork of the glazing

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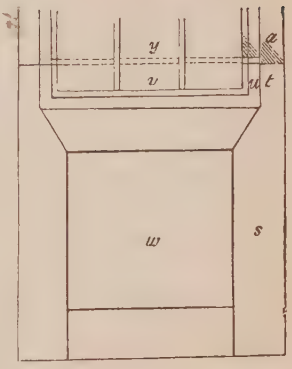

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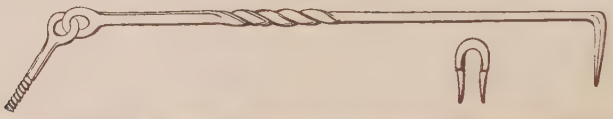

is fixed), &c., complete. The other windows to have deal-cased frames, oak sunk sills, one inch and a half astragal and hollow sashes, double hung with iron weights, and best white lines, brass pulleys, and patent spring sash-fastenings. The sash windows, except the sitting-rooms, to have one-inch wrought hinges, and one inch and a quarter wrought and rounded window-boards. All the windows, except those of the basement, to have grounds and mouldings to match the doors. The kitchen, wash-house, store-room, and pantry to have one-inch thick square framed folding inside shutters, with rule joints, proper hinges, and iron bar fastenings. The sitting-rooms to have one inch and a quarter proper boxings (the frames which receive the architraves and the outer edges of the shutters are called proper boxings, when they are wrought, framed, rebated, splayed, and beaded), and architraves to match the doors; one inch and a quarter ovolo flat backs and splayed elbows (in fig. 237, *a a* are the elbows; *b* is the capping, or, as it is called when of some width, the window-board), and soffits (the part of the architrave which projects over the columns, but the term is used generally for the under side of any horizontal projection), with proper capping (the coping or covering to the elbows and backs of the windows; viz., to *a a*, as shown at *b b b*, in fig. 237), one-inch bead and butt back linings; one inch and a quarter ovolo flat shutters, with one inch bead and butt back flaps (framed in panels, with a bead struck on the panel sides only), with proper hinges, strong wrought-iron spring shutter bars, and brass spring fastenings. (Fig. 238 is a section of part of a bead, butt, and square back door; in which, *c* is the style, *d* the panel, *e* the bead on the front side of the panel, and *f* the square back of the panel. Fig. 239 is a section of part of

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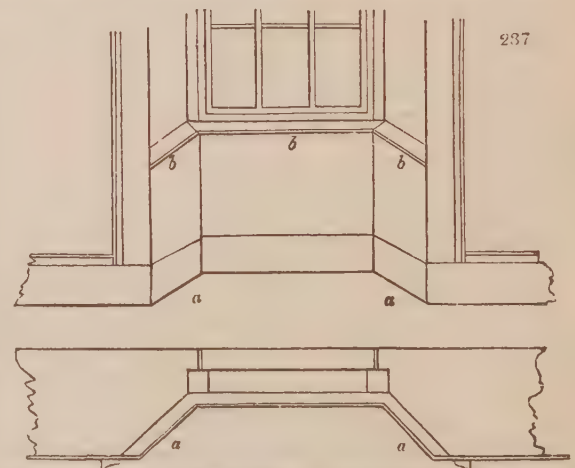
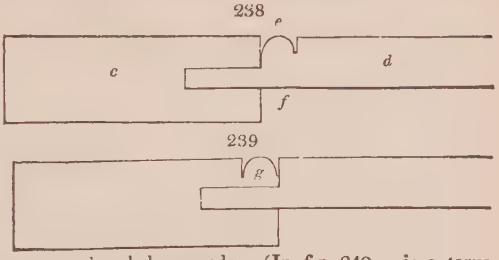
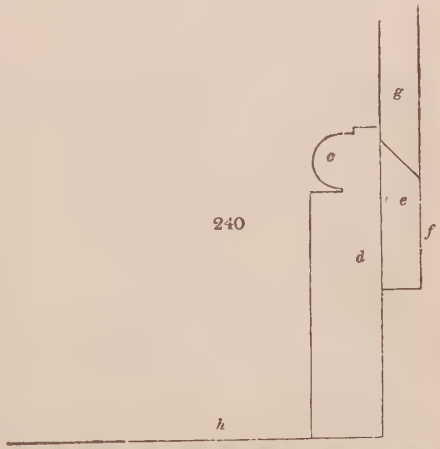
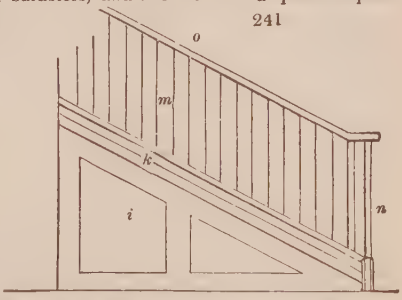
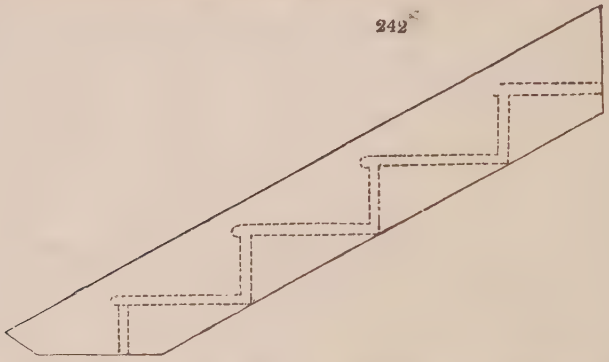


a bead flush door, in which the bead, *g*, is struck upon the styles, and returned on the rails, so as to surround the panel.) — Skirting. Chamber floor to have three quarters of an inch square skirting throughout, four inches and a half high. The sitting-rooms and entrance passage to have one-inch torus skirting, eight inches high; all the skirting to have narrow beveled grounds. (In fig. 240, *c* is a torus moulding on the skirting, *d*, which is nailed to the beveled ground, *e*; *f* is the wall; *g*, the plaster; and *h*, the floor of the room. The grounds are beveled, in order that they may retain the plastering better than by a horizontal joint.) Principal staircase to have one-inch yellow deal steps, risers, and carriage (pieces which bear the brackets till the steps are fixed), with moulded nosings to the steps to be housed (let in) into the close stringing, which is to be one and a quarter inch thick, sunk, and moulded with a moulded planceer (a moulded capping to the stringing into which the balusters are fixed) with one inch and a quarter raking (following a slope) torus wall string-housed to the steps and risers. To put deal turned newels (posts firmly framed to which the handrail is fixed) and moulded handrail, and three quarters of an inch square deal bar balusters, and one inch and a quarter square framed spandril to enclose the cellar stairs. (In fig. 241, *i* is the spandril of the stairs; *k*, the string; *l*, the planceer; *m*, the balusters; *n*, the newel; and *o*, the handrail. Fig. 242 represents the string board, in which the dotted lines show the housings.) The cellar stairs to have one-inch deal risers, one inch and a quarter oak treads with rounded nosings and proper carriage, a deal handrail, newel (turning) post, and one and a quarter inch string boards with steps housed in. The pump to have one inch and a half oak cheeks (sides) and silis, cased with one-inch deal, with proper cap, &c.; which is to be fixed in the wash-house. The angles of the chimney breasts to have proper staff beads (upright corner beads put at the external angles of chimney jambs, and in similar situations. In fig. 243, *p* is the section of the staff bead; *q q*, the plaster; *r r*, what are called the quirks in the plastering; and *s*, the wall.) Two hundred feet (lineal) of one-inch thick wrought and rounded shelf board, twelve inches broad, to be prepared and fixed with brackets and iron hold-fasts in the pantry, store-room, and closets, or elsewhere, as may be directed by the employer. Yellow deal balconies to be put up to one of the front and two of the side windows, as shown by the drawings; with moulded handrail, and turned balusters; the floor wrought on both sides, moulded on the edge, and two inches and a quarter thick; having four cut brackets three inches thick to support each: the whole to be firmly and securely fixed. Flower-stands of good yellow deal to be put up to the two front windows as shown by the drawings, and finished according to figs. 8 and 9, in plate of details, page 118. An oak moulded sill and a deal moulded handrail to be put round the back part of the building: these are to be framed into the posts, and the



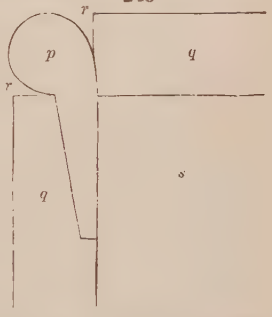






turned balusters housed into the same. The posts are to be wrought, framed, and chamfered, seven inches square, with iron tenons (square pieces of iron fitted into mortises, that is, into holes cut to receive them) at bottom; and circular wrought framed braces at top, to support the eaves of the projecting roof of the kitchen, wash-house, &c. The carpenter and joiner are to find all tools, labour, glue, nails, and every description of ironmongery, locks, bolts, bars, hinges, fastenings, and the fixing of the same, and every thing required for the completion of their works; which must be done in the best and in the most substantial and workmanlike manner; and to prepare and fix all kind of beads, stops (a term variously applied, but chiefly to slips nailed on for doors or shutters to shut against, or for fixing work), fillets, grounds, linings, and backings (back linings, required for the perfect execution of the above, whether the same may or may not be minutely specified in this particular; the whole to be done, subject to the provisions in the general particular at the end hereof.

243



240. *Specification of Plumber's Work.* Flashings of milled lead ten inches wide, weighing five pounds a superficial foot, to be chased into the brickwork (see § 85), and fixed with wall-hooks (fig. 244.), where the roof abuts against the brick walls, as well as to each of the chimney shafts, which must have aprons (strips of lead, to throw the wet from the joint between the roof and the chimney shaft) where they are required. The gutters against the chimney shafts to be covered with lead weighing seven pounds to the superficial foot. The hips, ridges, and valleys to be covered with milled lead, fifteen inches broad, weighing five pounds the superficial foot; the whole to be properly lapped, dressed (smoothed), and nailed with lead-headed nails. The sink to have a six-inch brass grate and bell-trap (see figs. 222, 223, and 224), and a two and a half inch lead pipe. A good stout four-inch lead pump barrel, weighing 2 qrs. 14 lbs., with bucket, sucker, and wrought-iron thandle, complete, and forty feet of two and a half inch lead suction pipe, to be put up in he wash-house.

241. *Specification of Glazier's Work.* The basement story windows to have lead lights, and Newcastle crown-glass (crown-glass is white or colourless, and is so called to distinguish it from green glass), in quarries. All the sashes, including that of the front door, to be glazed with good second Newcastle crown-glass; the best squares to be selected for the sitting-rooms.

242. *Specification of Painter's Work.* To knot (cover the knots with paint, before the general painting), prime (give the first coat), and paint the whole of the external wood and iron work four times in oil, with good white lead, and to finish the same in a light stone colour; with the exception of the doors, which are to be finished olive green. The whole of the joiner's work, internally, with the exception of the floors, shelves, and the risers and treads of the stairs, to be knotted, primed, and painted three times in good white lead and oil; and the sitting-rooms to be flatted (the glossy appearance of the

paint to be taken off by using turpentine in the last coat, instead of oil). The plumber, the painter, and the glazier to find all materials, workmanship, and carriage, and every thing requisite for the performance of their works; and to do the same in a perfect and workmanlike manner; subject to the conditions in the general particular at the end hereof.

243. *General Particular.* The whole of the foregoing works to be entirely finished and completed on or before the day of ; and the several portions to be performed in such order of succession as to insure the final completion of the whole by that time. Each contractor to be answerable for any damages that may be done to his respective work during its progress (fire excepted), whether by the inclemency of the weather, or otherwise; and to make all good, and to leave the same perfect at the final completion of the work. The whole of the works are to be paid for within after the completion of the contract. If the contractor or contractors shall omit to complete the work by the time specified, a deduction of 1 per cent shall be made from the amount of his or their contracts, for every week the time shall be exceeded. The whole of the materials are to be of a sound and good description, and fit for their several purposes. The works are all to be done in a substantial and workmanlike manner; and every thing is to be performed that is necessary for completing the whole of the work in the usual and customary manner, notwithstanding any omissions that may have occurred in the foregoing particulars: and if any alteration shall be made, by the direction of the employer, it shall not vitiate or annul the contract; but the value of such alterations shall be ascertained at the customary prices of the neighbourhood, by of ; whose decision between the parties shall be final. And further, if any or all of the works should be performed in any way inferior to the description and intention of the particulars and drawings, or shall be deteriorated below a fair standard of good quality or sound workmanship; the same shall also be valued by as aforesaid, and the sum deducted from the amount of the contract by the employer: the decision in this case also shall be final. And further, if, in the course of two years from the completion of the said work, there should become manifest any latent defects, resulting from imperfect or careless workmanship, or from badly burnt bricks, unseasoned timber, or other materials, the contractor shall be held to make the same good, upon receiving notice from to do so; and in case the said contractor shall neglect or refuse to make good such defects within one calendar month from the date of such notice, to the satisfaction of the proprietor, he shall be at liberty to employ such other persons to do the same as he may think proper; the expense of which shall be borne by the said contractor or contractors. The contractor or contractors to sign an agreement to perform the work according to the foregoing particulars and conditions therein; which agreement shall contain such additional clauses as the solicitor to the employer shall deem requisite to secure and enforce the fulfilment of the same. Satisfactory security for the performance of the work to be given by the contractor, if required.

244. *Estimate in Detail* of the expense of building a cottage residence according to the annexed plans and particulars of Design XXXII.

245. *Estimate of Excavator's, Well-Digger's, and Bricklayer's Work.*

	£	s.	d.
One hundred and sixty-eight cubic yards of digging, filling, and ramming, for the foundations, cellar story, and drains			
One cesspool, dug and steened in four-inch brickwork, nine feet deep, and four feet clear in diameter			
One well, dug and steened in four-inch brickwork, forty-five feet deep, and four feet clear in diameter			
Five rods two hundred and fourteen feet of reduced brickwork in foundations below the level of the plinth (grouted)			
Ten rods two hundred and eleven feet of brickwork above ground, flushed solid, with flat ruled joints			
Two thousand and twenty-seven feet six inches, superficial measure, of extra-labour in picking stocks of equal colour for the facing			
One hundred and ninety feet seven inches of gauged arches			
Seventy-five yards and a half of nogging flat			
Fifty yards of stock brick paving, laid flat in sand			
Fourteen yards of paving bricks, bedded and jointed in mortar			
Twenty-four yards of ten-inch tile paving, bedded and jointed in mortar			
Seventy-six yards of pebble paving, laid in sand			
Thirty-four feet lineal of cuttings to rakes, &c.			
Thirty-four feet lineal of chasings cut for lead flashings, and making them good with Roman cement			

Fifty feet extra, to the setting of brick on edge coping in cement (labour and cement) .....
Ninety-six feet of beveled brick coping, and fixing the same .....
One hundred feet of hollow tile drain, twelve inches clear in the bore (tube or tunnel), and setting the same .....
Eight feet superficial of Yorkshire stone paving, to cover the well and the cesspool .....
Sundries — Two iron rings to the cover stones of the well and the cesspool, and letting in and fixing the same.....
Fourteen garden pots and pans for the piers of the parapet, twenty inches high .....
Twenty-two window-frames bedded and pointed in lime and hair mortar .....
Seven door-frames bedded and pointed in lime and hair mortar .....
Eight Roman cement chimney shafts seven feet high (as shown by the details), and fixing and flanching up the same with cement and plain tiles .....
Eight chimney bars .....
A cast-iron door with wrought-iron hinges, latch, &c., to the oven, and fixing the same.....
Five sink stones in the areas, with five holes cut in each .....
Nine cast-iron eight-inch stink-traps, and setting them.....
Bedding bond plates and lintels in loam (loam is used in bedding, because a bedding of lime is supposed to destroy the timber) .....

£362 : 6 : 4

246. *Estimate of Plasterer's Work.*

One hundred and fifty-eight yards of lime-whiting twice over.....
Two hundred and nineteen yards of whiting to new work .....
Forty-four yards of stone-colouring on cement .....
One hundred and fifty-five yards of floated render set .....
Eighty-seven yards of lath-layed and set .....
Three hundred and eighty-five yards of lath plaster, floated and set
One hundred and fifty feet lineal of plaster cornices, as per drawing
Four extra mitres in the cornices.....

£64 : 9 : 10

247. *Estimate of Slater's Work.*

Twenty-three squares and a quarter of countess slating, with wrought-copper nails .....

£41 : 17 : 6

248. *Estimate of Stonemason's Work.*

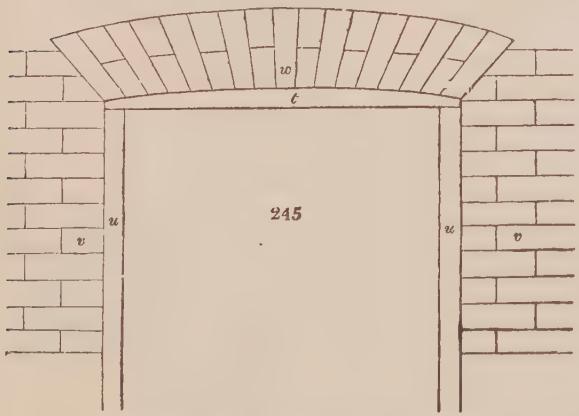
Seven feet superficial of plain work to the Portland stone shelf.....
Twenty-eight feet of Portland stone chimney-pieces.....
Eight feet ten inches of Portland stone, one and three fourths of an inch thick.....
Thirty-six feet seven inches of Portland stone slabs.....
Twenty-five feet six inches of Yorkshire stone hearths.....
Fifty-nine feet six inches of Yorkshire stone paving, and pier caps...
Eight feet nine inches of four inch Yorkshire stone landing,.....
Eleven feet three inches of Yorkshire stone sink, six inches thick....
Forty-six feet five inches of one and a quarter inch milled slate skirting, fixed with cramps, and set in cement.....
Ten feet two inches of lineal rounded edge to the Portland stone shelf .....
Five feet lineal of rounded edge to the Yorkshire stone landing, four inches thick .....
Seventy-three feet four inches of York quarry stone sills, eight inches wide, beveled, throated, and tooled (quarry stone is a term applied to stones prepared at the quarry, for any particular purpose, such as sills, copings, steps, &c.; without being very carefully tooled, or rubbed) .....
Ten feet of York quarry stone coping, twelve inches wide .....
Forty-five feet of Yorkshire stone steps.....
Two veined marble chimney-pieces in the parlours, at £7 each ..

Twelve chimney cramps .....
One hole cut in the sink for a bell-trap .....

£53 : 6 : 8

249. *Estimate of Carpenter's and Joiner's Work.*

Four hundred and twelve feet eight inches cubic of Memel, or Dantzic fir, framed in the roof, the floors, and the partitions.....
Twenty feet three inches of wrought and framed timber, in brackets, cut circular .....
Six feet eight inches of wrought and framed timber, in brackets with chamfered edges.....
One hundred and six feet ten inches of oak in the bond-plates and lintels.....
Fifty-four feet eight inches of oak, framed in single flooring .....
Sixty-six feet superficial of feather-edged valley-boards .....
Sixty-seven feet eight inches of three-quarter inch wrought eaves fillet .....
Nineteen squares sixty-eight feet of three-quarter inch slips, two and a half inches wide, for countess slating .....
Twenty squares thirty-four feet of inch yellow deal battening, two and a quarter inches wide, and twelve inches apart .....
Twenty-four feet superficial of inch gutters and bearers .....
Ninety-four feet one inch superficial of one and a quarter inch keys
Ninety feet nine inches of hips and ridges rounded .....
One hundred and thirty-five feet four inches of feather-edged eave-boards, with wrought and rounded edges .....
Fifty-three feet one inch of three-inch cut brackets, wrought and notched to the rafters .....
Sixty feet of barrel curb to the well .....
Sundries. — Oak wood bricks.....
Twenty-three slip centres to the arches (a slip of deal cut to the intended line of the soffit of the arch, and supported by an upright piece against each jamb. In fig. 245, *t* is the slip centre; *u u*,



the upright pieces which support it; *v v*, the jambs; and *w*, the arch .....

£810 : 17 : 1

250. *Estimate of Joiner's Work.*

Eighty-five feet cubic of fir, wrought, framed, and chamfered .....
Two cubic inches of oak-framed pump sill. (This may seem a small quantity; but the fact is, that surveyors and builders divide the cubic foot, which contains 1728 cubic inches, into twelve parts, which they call inches; so that the two cubic inches in this estimate are $\frac{2}{12}$ of 1728, or 288 cubic inches. This custom is adopted by surveyors, to save them the trouble in calculating the money value of fractional parts of cubic feet).....

Thirteen feet eleven inches of oak proper door-cases.....
Six feet six inches of oak proper two-light window frames .....
Eighty-six feet superficial of three-quarter inch square skirting .....
Ten feet four inches of latticing.....
Two hundred feet of inch wrought shelves .....
Thirty-five feet one inch of ditto bead and butt back linings.....
Twenty-one feet eight inches of ditto pump casing.....
Seventeen feet of ditto wrought lining tongued.....
Five feet of ditto apron lining .....
Fifty-eight feet six inches of ditto torus skirting .....
Sixty-six feet of ditto proper ledged doors.....
One hundred and twenty feet eight inches of ditto square framed folding shutters, with rule joints. .....
Eleven feet of ditto clamped lifting shutters, circular headed .....
Two hundred and ninety-four feet six inches of ditto wrought, framed, and sunk grounds .....
Fourteen feet seven inches of ditto deal risers and carriage .....
Seventy feet one inch of ditto yellow deal steps, risers, and carriage (the piece which carries the steps), with moulded nosings (the edges of the steps which are exposed to view).....
Seven squares thirty-four feet of ditto yellow deal folding floors.....
Three squares ninety-three feet of ditto yellow deal straight-jointed floor
One foot of one and a quarter inch cap to the pump.....
Fourteen feet eight inches of ditto square framed piers.....
Nineteen feet six inches of ditto wrought and rounded window board
One hundred and ninety-six feet four inches superficial of ditto four-paneled doors, both sides square.....
One hundred and ten feet eight inches of ditto single-rebated jamb linings.....
Twenty-four feet of ditto square framed spandril.....
Thirty-four feet two inches of ditto proper boxings .....
Twenty feet of ditto sunk and moulded close strings.....
Fifty-two feet of ditto raking torus wall strings. .....
Twenty-five feet of ditto treads of oak, and rounded nosings .....
Ninety-six feet six inches of ditto ovolo flat shutters, with inch bead and butt back flaps .....
Forty-four feet nine inches of ditto ovolo flat backs, elbows, and soffits splayed.....
Twenty-eight feet nine inches of one and a half inch single-rebated jambs, with circular heads .....
Seventeen feet ten inches of ditto six-paneled doors, both sides square
Thirty-five feet eight inches of ditto six-paneled doors, moulded on one side, and square on the backs.....
Three hundred and eighty-six feet of ditto deal cased frames, oak sunk sills, one and a half inch astragal, and hollow sashes; double-hung with iron weights, best white lines, and brass pulleys .....
Nine feet four inches of ditto oak pump cheeks.....
Twenty-two feet nine inches of one and three quarter inch six-paneled doors, square on both sides, and circular-headed.....
Twenty feet of two-inch deal floor to the flower balconies.....
Twenty-two feet nine inches of deal sash doors, one and a quarter inch astragals, and hollow sashes, circular headed, double-margined and diminished styles, three reeds, flush fronts and square back at bottom.....
Ninety feet of two and a quarter inch deal wrought floor to the balconies.....
One hundred and thirty-two feet nine inches of three-inch cut brackets, wrought.....
Five hundred and nine feet superficial of mouldings.....
Ninety-six feet superficial of oak mouldings.....
Three hundred and seventeen feet three inches lineal of inch narrow beveled skirting and grounds .....
One hundred and five feet of staff beads.....
Five hundred feet of quirked ovolo, and fillets .....
Fifteen feet of moulded planceer .....
Six feet of moulded nosings (on the staircase landing to form the edge)

One hundred and eighty feet of three-quarter-inch square bar balusters.....
Twenty-one feet of deal moulded handrails .....
Six feet of plain deal handrails .....

£

251. *Estimate of Ironmongery and Fixing with Screws and Nails.*
Four pair of eighteen-inch cross-garnet hinges.....
Ten pair of rule-jointed hinges.....
Twenty-four pair of shutter hinges.....
Twenty-one pair of two and a half inch butt hinges.....
Nine pair of three and a half inch butt hinges .....
Four bright rod bolts six inches long.....
Four stock locks eight inches long.....
Two iron rim ten-inch drawback locks .....
Seventeen patent spring sash fasteners.....
Three mortise locks, with plain brass knob furniture.....
Seven iron rim six-inch locks, with brass knobs.....
Nine iron bar shutter fastenings.....
Eight brass spring shutter fastenings.....
Two studs and plates.....
Two shutter lifts .....
One plate and screw fastening.....
Four Norfolk latches .....
Five wrought-iron casements .....
Five stay irons to the casements.....
Twenty saddle bars of iron.....
Twenty iron tenons.....
Thirty square wrought-iron inch stanchion bars, three feet six inches long.....
Forty holdfasts (fig. 246) to the shelves.....

246

Twelve iron tie fastenings, to fix the brackets to the balconies.....
Sundries. — Four elbow caps.....
Thirty steps housed into the strings at both ends.....
Four deal turned newels .....
Four turned knobs and bases, one foot high, and four inches in diameter.....
Fifty-four turned balusters, three feet three inches high, and three inches in diameter .....
One hundred and ninety-four housings to the balusters.....
Forty wrought brackets to the shelves.....
Forty-three turned balusters, three feet seven inches long.....

£260 : 11 : 7

252. *Estimate of Plumber's, Painter's, and Glazier's Works.*
Thirteen cwt. 8 lbs. of milled lead.....
Forty-one superficial feet of lead lights and quarry glass.....
Two hundred and forty feet seven inches of Newcastle second crown-glass in sashes .....
Four feet lineal of two and a half inch lead pipe to sink .....
Forty feet of two and a half inch lead suction pipe .....
One six-inch brass grate and bell-trap.....
One stout four-inch lead pump barrel, and fixing the same.....
One iron handle, bucket, and sucker, for the pump .....
One hundred and ninety-two yards, three times painted in oil.....
Forty-eight yards, three times painted in oil and flatted .....
Three hundred and twenty-three yards, four times painted in oil.....
Five yards, four times painted in oil of an olive-green colour.....

One hundred and five feet lineal of staff beads, three times painted in oil.....
Twenty-seven feet of handrail, three times painted in oil.....
Two hundred and twenty-nine feet six inches of skirting, four inches high, three times painted in oil.....
Sixty-seven feet nine inches of torus skirting eight inches high, three times painted in oil and flatted.....
Twenty feet of torus skirting, three times painted in oil.....
Ten lights, five casements, three times painted in oil.....
Twenty saddle-bars, three times painted in oil.....
Nine shutter-bars, three times painted in oil.....
Three newels, three times painted in oil.....
Sixty balusters, three feet long, three times painted in oil.....
Twelve dozen and a half of squares and frames three times, painted in oil.....
Four dozen squares and frames, three times painted in oil, and flatted
Sixteen dozen and a half of squares and frames four times, painted in oil.....
Ten lights, five casements, and five stay irons, four times painted in oil.....

£98 : 8 : 1

253. *Summary of Estimates.*

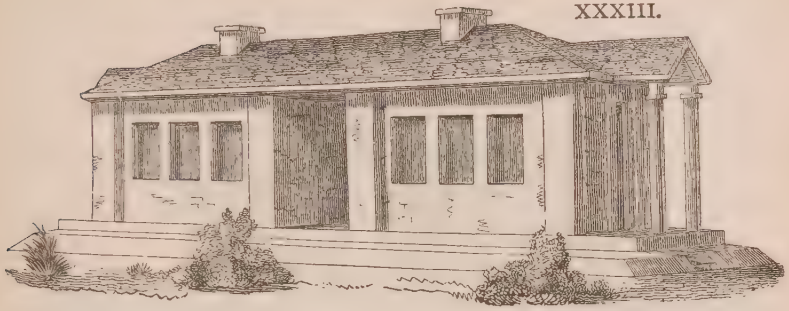
Excavator, Well-digger, and Bricklayer.....	362 : 6 : 4
Plasterer.....	64 : 9 : 10
Slater.....	41 : 17 : 0
Stone Mason.....	53 : 6 : 8
Carpenter, Joiner, and Ironmonger.....	441 : 8 : 8
Plumber, Painter, and Glazier.....	98 : 8 : 1
	£1061 : 16 : 7

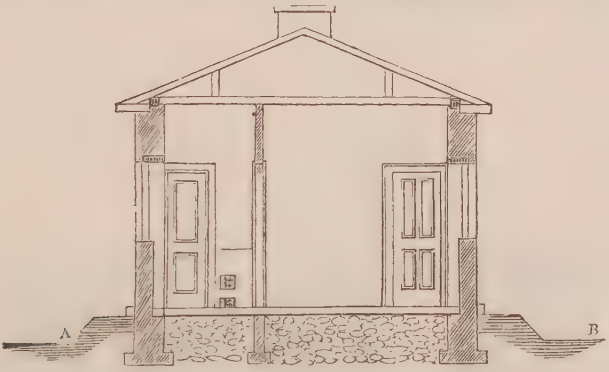
254. *Architect's Fee.* The above sum is exclusive of the Architect's fee, which, for small buildings, is generally 5 per cent on the amount, independently of a sum charged for the drawings; say, in the case of a cottage, £10, or upwards. In the case of larger buildings, say such as amount to £1000, or upwards, the Architect is content with his commission and travelling expenses; for which he supplies all the working drawings as the work is going on, and visits it from time to time. When plans are made for any building, and the work is not executed, a charge is made according to the value of the drawings. In many, perhaps in most, cases of very large buildings, a clerk of the works, resident on the spot, furnishes most or all of the working drawings, under the occasional direction of the architect, who in this case receives a smaller commission, or a certain sum per annum while the work is going forward.

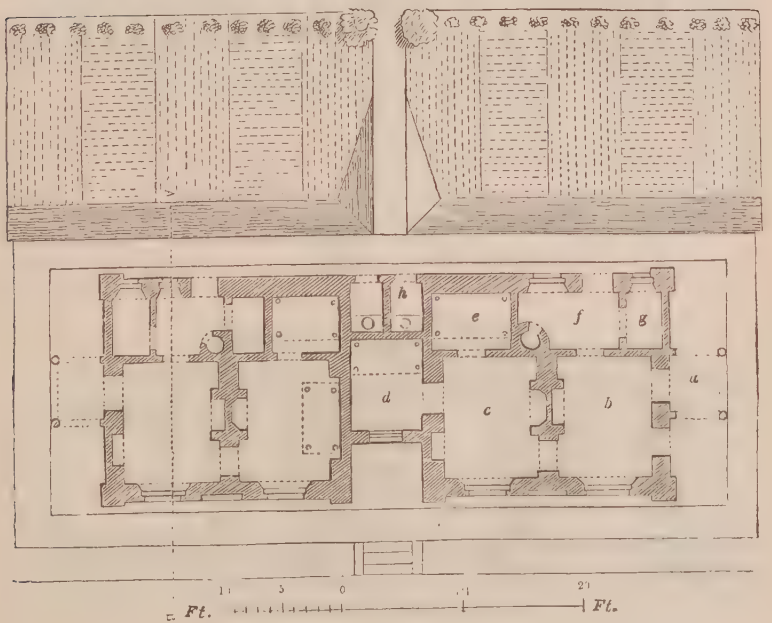
255. *An Estimate* for this design, formed on the cubic contents, will serve in some measure as a guide for the price per cubic foot, at which dwellings so carefully finished and ornamented as the present, should be calculated. The number of cubic feet in Design XXXII. is about 32,000; which, at 7¾*d.* per foot, amounts to £1060. If we add a farthing per foot for the Architect, we shall have about £1130 as the cost of this cottage, and 8*d.* as the rate per cubic foot, at which such cottages should be calculated, in a general or guess estimate.

256. *Remarks.* This Design conveys the expression of a comfortable, and even elegant dwelling. There is much of style in its external details, and yet we cannot point to any particular manner as its type. Its contributor, says, "I do not know what style it can be said to be in; it is of so complicated a nature in its details, that I know of no term which expresses their general result. Were I requested to analyse its component parts I should give it as my opinion that the gables resembled those of the Italian style; the balustrading and galleries, the Flemish or German manner; and that the large projecting eaves partake of the Swiss character. I say this with due deference to Architects who have visited foreign countries, for my ideas are derived from books alone. The hood over the entrance door is somewhat similar to those made use of in the Berkshire farm buildings. Whatever may be said of the kind of style exhibited in Mr. Varden's Design, all our readers, we think, will agree in the praise which we have already (§ 231 and 233) bestowed on it. The effect of the whole is highly picturesque, and nothing seems wanting to render the dwelling complete. Considering the number of rooms, the decorations, &c., it certainly cannot be considered an expensive structure, for the neighbourhood of London. A very good situation for it would be the north side of a public road, with a lawn in front, fig. 247 (on a scale of about forty feet to an

XXXIII.



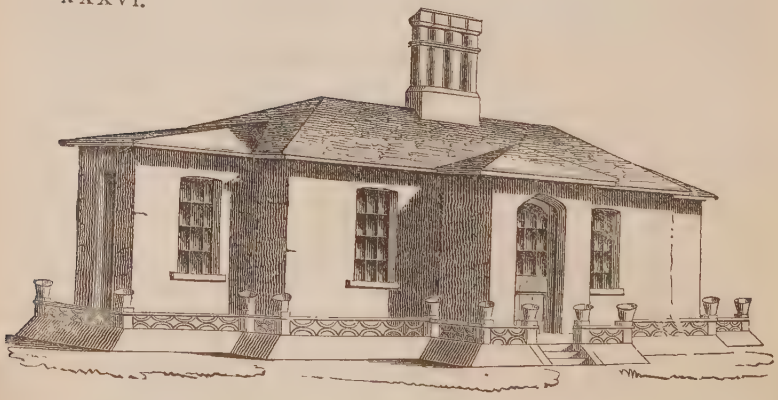


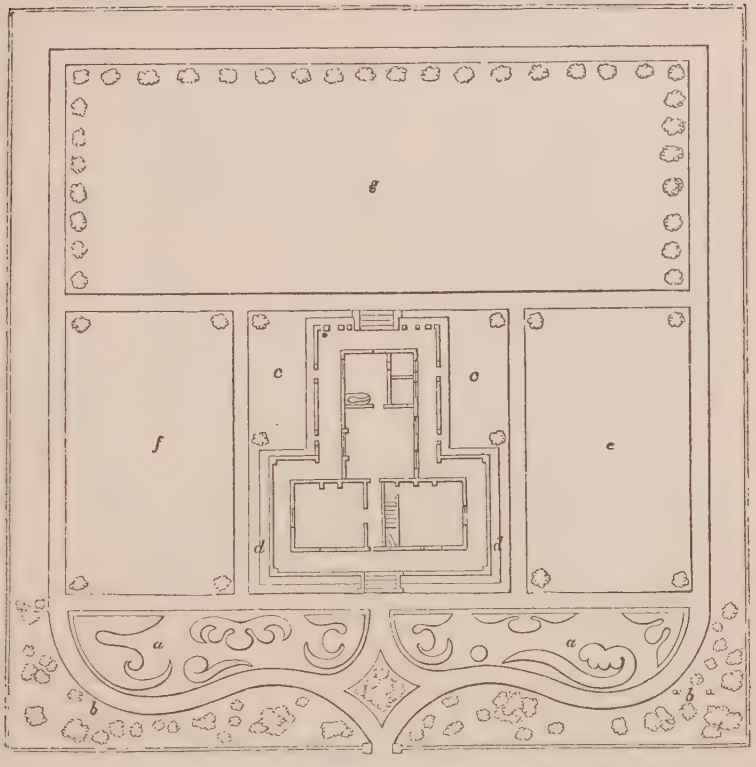


XXXIV.

XXXV.

XXXVI.





inch), varied by groups of flowers, *a a*, and by scattered shrubs, and ornamental trees, *b b*; with two small flower compartments, *c c*; a narrow border at the base of the terrace, *d d*; an orchard of gooseberries, currants, and raspberries, *e*; a compartment for asparagus, sea-kale, tart rhubarb, strawberries, and other perennial crops, *f*; and another compartment for common culinary crops, surrounded on three sides by dwarf fruit trees, *g*. The boundary borders may be occupied with small and very early crops; and the walls should be planted with fruit trees. The walks may have box edgings, and be gravelled; or, should the dwelling be in a neighbourhood where flag-stones are abundant, they may be paved, the pavement resting on stone piers, by which a great annual expense in keeping the walks and their edgings clean and in repair will be saved, and the ground underneath them rendered available for the roots of the fruit trees in the borders.

Design XXXIII.—*Two Cottage Dwellings, under the same Roof; each having Two Rooms and other Conveniences.*

257. *Accommodation.* Each of these dwellings contains a porch, *a*; kitchen, *b*; and bed-room, *c*, which may be made a sitting-room, by placing the bed in the closet, *e*. There is also to each a back kitchen, *f*; a pantry, *g*; and a privy, *h*. One of these dwellings has an extra bed-room, *d*; and a very little change in the arrangement, as will be shown afterwards, would give a light bed-room to the other also. Some use may be made of the roof, by having trap-doors and ladders, as recommended in § 179. fig. 158.

258. *Construction.* This building having only one story, the walls may be made of earth, smoothed, and lime-whited externally; and lathed and plastered inside. The columns of the porch may be portions of the trunks of fir or pine trees, with the bark removed, and the knots and other irregularities reduced. The roof may be of slate; and, as it is of considerable span, it may be constructed as in fig. 248. with principal and secondary rafters.

259. *General Estimate.* Cubic contents of the two houses, 15,868 at 6*d.* per foot, £396 : 14*s.*; at 4*d.*, £264 : 9*s.* : 4*d.*; and at 3*d.*, £198 : 7*s.*

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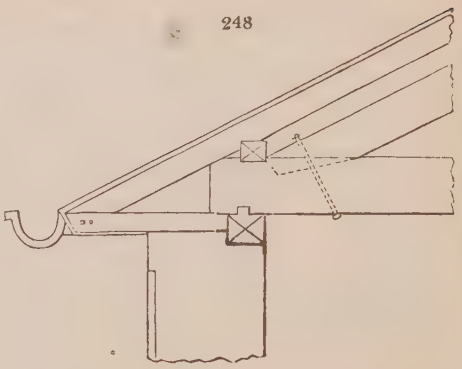

260. *Remarks.* Looking at the elevation, we should say that this is a simple and somewhat elegant Design; and at the plan, that it appears convenient. When we examine it critically, however, we perceive that the windows are not sufficiently high for the purposes of ventilation; and that their proportions are not such as are commonly received as elegant. On examining the section, it will be found, that the heads of these windows are not near so high as the ceiling, and that the window sill is more than the usual height from the floor. We must, therefore conclude that the designer of this cottage intended it for a warm climate, where it would be desirable to exclude the light; but even if that were the object, it might have been effected better, by having windows of the same form close under the eaves. The interior of such a cottage, in Britain, would be gloomy, and the ventilation bad; but its appearance, as well as comfort, would be improved by changing the proportions of the windows. There is one great fault in delineating the elevation of this Design, which must not be passed over. It consists in representing the two false windows in the principal front exactly in the same manner as the real ones. Let the reader make a sketch without these false windows, or cut out a bit of white paper, and place it over them in our elevation, and he will see how different an effect will be produced. Whenever the effect of any design depends mainly on any thing not essential to its use, the critic may always be certain that there is something wrong. In general, also, when imitations of the effect of time on buildings are introduced in architectural designs, they are to be looked on with suspicion; as well as all accompaniments of trees, clouds, and figures. A design for a building should always have a distinct and independent beauty in itself; a beauty which can be conveyed by lines in correct perspective, without any reference to either shading, colouring, or accompaniments. Examined by these tests, some of the most showy works on Cottage Architecture, of the present day, will be found to be little better than pictures for the eye; or, as some would express it, to gratify the sense of the picturesque. The Design before us is capable of very great improvement; and, by altering the ground plan, as in fig. 249, two most comfortable

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dwellings, of two rooms and two bed closets, with a back kitchen, pantry, and privy, to each, might be obtained under a very handsome exterior. Fig. 250 shows the perspective elevation of the principal front, in which a close porch, with square columns, is shown instead of an open one, with round columns. It is intended that the door shall be placed on whichever side of this portico may best suit the prevailing winds of the given situation. If the building were to stand east and west, the door of the porch ought to be on

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one side, and that, of course, the south; if it stood north and south, then the door of the south porch ought to be on the south side; and that of the north, on either the east or west, which ever may be considered the mildest aspect. Fig. 251 shows the back elevation of these cottages, which will be found as handsome as that of the principal front, though differently composed. This also is a test of excellence in architecture. When-

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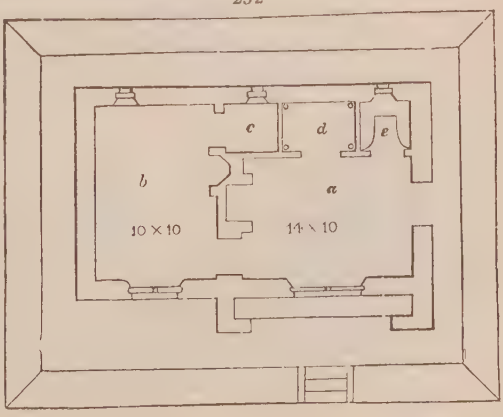
ever any one side of a building is not as good in architectural design as another side, it may infallibly be considered as a proof of either poverty of invention or negligence in the Architect; or of want of means or of spirit in the employer. On the whole, for cheap and yet elegant cottages of the lowest degree of accommodation, we can recommend this improved version of Design XXXIII. as equal to any thing which has been yet given in this work. In a recent number of the *Gardener's Magazine* (vol. viii. p. 263), we have animadverted on the miserable hovels of one room, recently built on the Duke of Buccleugh's estate in Dumfriesshire; and on some still more wretched habitations, built along the coast in Wigtonshire. We would recommend to the amiable Duchess of Buccleugh to advocate the substitution of dwellings like those before us, for the cottages to which we have referred, on her husband's estate.

Design XXXIV. — *A Cottage Dwelling of Two Rooms, intended as a Gate Lodge.*

261. *Accommodation.* In the ground plan of this Design, fig. 252, there is a kitchen, *a*; with a bed-room, *b*; a light closet to the bed-room, *c*; a bed closet from the kitchen, *d*; and a pantry, *e*.

252



262. *Construction.* The exterior walls may be of earth or stone; and the interior of brick nogging flat, with the exception of the chimney stacks. The pitch of the roof being low, it must be covered with slates, or with Grecian or Tuscan tiles.

263. *General Estimate.* Cubic contents, 7770 feet, at 6*d.* per foot, £194*l.* : 5*s.*; at 4*d.*, £129 : 10*s.*; and at 3*d.*, £97 : 2*s.* : 6*d.*

264. *Remarks.* The expression is simple and appro-

priate; and it is heightened by the bench under the recess, which may be supposed to be placed opposite the gate which the occupant is expected to open, and gives an air of ease and attendance on his part, as a porter's chair does in the hall of a mansion.

Design XXXV. — *A Cottage Dwelling of Three Rooms, with Back Kitchen, Cow-house, and other Conveniences.*

265. *Accommodation.* This is a commodious cottage, and all the accommodations being got within one roof, with the exception of two small lean-tos, it must be considered as promising to be economical in its erection. By the ground plan, fig. 253, it appears

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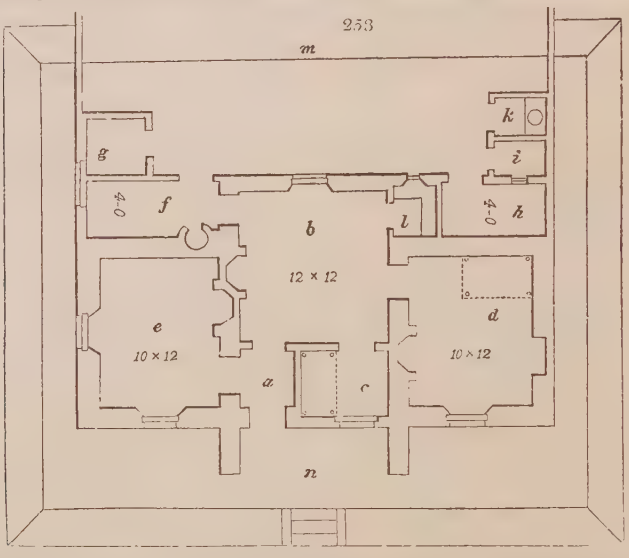

to contain an entrance, *a*, from under a projecting porch; a kitchen, *b*, with a bed-closet from it, *c*, for a child; principal bed-room, *d*; parlour, *e*; back kitchen, *f*; shed for fuel, *g*; cow-house, *h*; dairy, *i*; water-closet, *k*, with a cistern of water over it, supplied from the roof; and pantry, *l*. If the cow-house and dairy can be dispensed with, or removed to the yard, then *g* and *k* may be got out of *h*, and the whole building included under one roof; always a most desirable object. This alteration effected, the back elevation may be rendered symmetrical, and altogether as handsome as the front or the ends, as exemplified in the improved plan, fig. 254.

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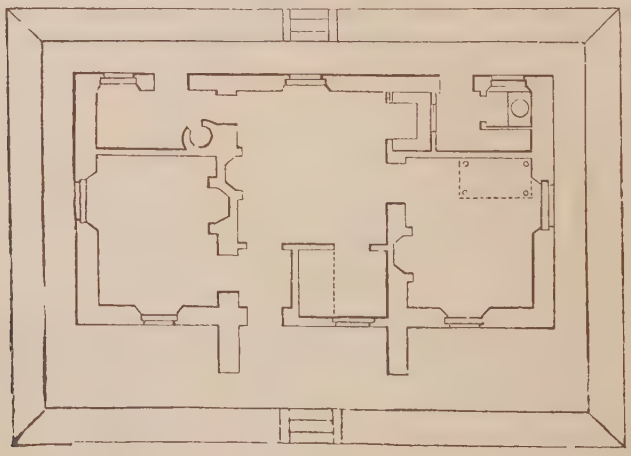

XXXVII.

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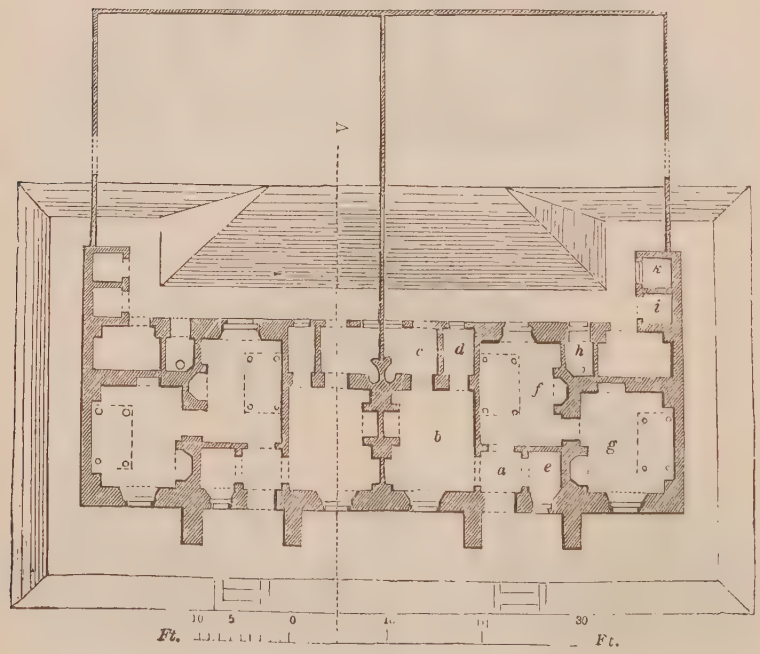

266. *Construction.* The walls are for the most part shown thick, as if built of earth or stone; and the roof is covered with Peake's Grecian terro-metallic tiles. These being heavy, require considerable strength of timber in the rafters; but their durability we believe to be greater than even that of cast-iron.

267. *General Estimate.* Cubic contents 13,904 feet, at 6*d.* per foot, £347 : 12*s.*; at 4*d.*, £231 : 14*s.*; at 8*d.*, and at 3*d.*, £173 : 16*s.*

268. *The expression* is somewhat analogous to that of the Scotch stone cottage, Design VII.; but the low pitch of the roof, the Grecian tiles, and the porch in front, are great improvements.

Design XXXVI. — *A Dwelling, with Four Rooms, a Back Kitchen, and other Conveniences.*

269. *Accommodation.* This is calculated to form a very comfortable habitation, and all the rooms being on the ground floor, the walls may be built of earth, and the apartments heated by flues in the floor from the back kitchen. The ground plan, fig. 255,

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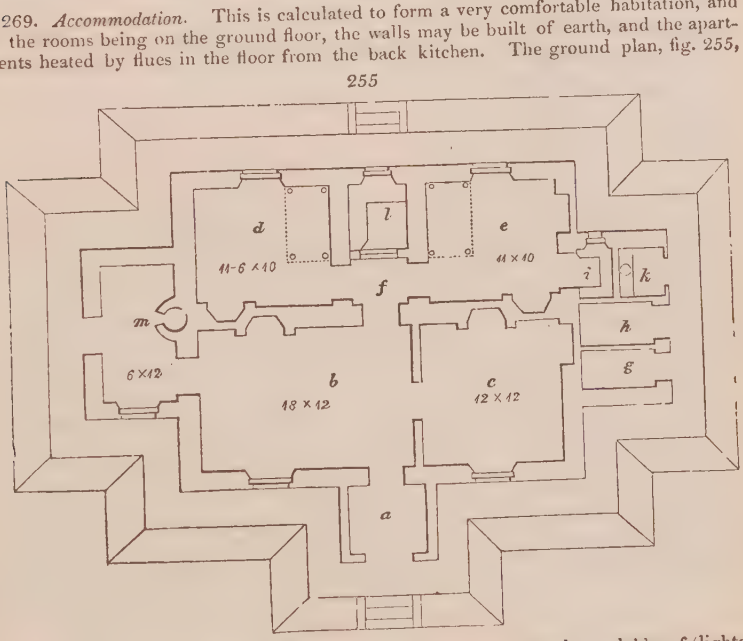

shows a porch, *a*, a kitchen, *b*; parlour, *c*; two bed-rooms, *d* and *e*; a lobby, *f* (lighted from the dairy,; a root-house, *g*; wood or coal house, *h*; pantry, *i*; privy, *k*; dairy, *l*; and back kitchen, *m*.

270. *Construction.* The walls may be of stone, finished with blocking courses, after the manner of Design VII.; the roof of slate, and the windows of sashes hung with weights and pulleys. The floors may either be of boards, or paved, and heated by flues from the back kitchen.

271. *General Estimate.* Cubic contents, 19,468 feet, at 6*d.* per foot, £486 : 14*s.*; at 4*d.*, £324 : 9*s.*; 4*d.*; and at 3*d.*, £243 : 7*s.*

272. *Remarks.* The expression is that of an humble but very comfortable dwelling; though little care has been taken to create allusions to any particular style. The door in the porch, and also the entrance to the back kitchen, ought to be varied relatively to the position of the sun, and the prevailing winds.

Design XXXVII. — *A Dwelling of Four Rooms, with other Conveniences, intended as a Lodge, or a House for a Bailiff, or Head-Gardener.*

273. *Accommodation.* The ground plan, fig. 256, contains a kitchen, *a*, entered from under a veranda; a parlour, *b*; a small bed-room, *c*; back kitchen, *d*, from which the whole may be heated; pantry, *e*; dusthole, *f*; place for potatoes and other roots, and for fuel, *g*; and privy, *h*. There is a closet under the staircase; and in the chamber floor two small bed-rooms, and a garret over the kitchen.

274. *Construction.* The walls of the main building are shown of extra-thickness, with a view to situations where the cheapest building material is compressed earth, or rubble

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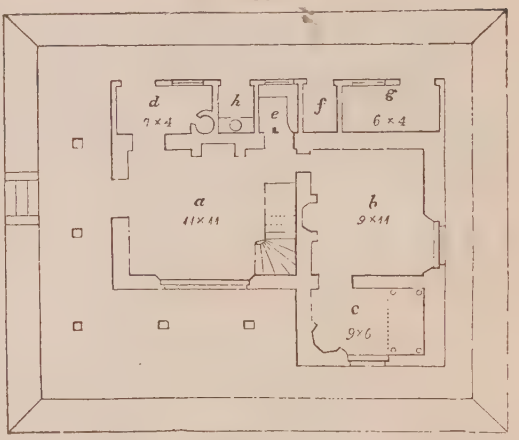

stone. In brick countries, hollow brick walls will be found both the cheapest and the best, both for the main building and the lean-to, containing *d*, *e*, *f*, *g*, and *h*. The roof may be of slate; the windows latticed; and the pillars of the porch of squared wood; or, in some countries, they would be cheaper and better of slate, or slate stone. It is not the custom to form such columns of earthenware tubes, such as are made for flues in hot-houses, both in Britain and on the continent of Europe; but we have no doubt that such a mode would answer well, the weight being carried by a prop of wood, iron, or brick, in the centre of the tubes. The terro-metallic earth of Staffordshire would form admirable columns, lintels, summer stones, copings, ornamental chimney tops, and other component parts of buildings. Indeed, much might be done with common brick earth; but, unfortunately for Britain, all articles formed of this material are heavily taxed, and, to save trouble to the exciseman, the brickmaker is only allowed to make his bricks of certain forms and dimensions; viz., for building bricks, nine inches by four inches and a half, and two inches and a half. If he deviates from these, and makes a brick either longer or broader than usual, or impresses a moulding on one end, or on one side, he renders himself liable to such an increase of duty as amounts to a prohibition of the article. Two or three centuries ago, bricks were made in every form, ornamental and useful, which the Architect could desire; for a proof of which, we have only to look to the Elizabethan mansions which still exist in different parts of the country. Even so early as the time of Henry VIII., the art of making bricks to serve all the purposes of stone in the jambs and lintels of doors and windows, appears to have been carried to a great degree of perfection. At Sutton Place, near Ripley, in Surrey, built by this monarch's brewer, the piers, lintels, mullions, chimney tops, tracery in the windows of the chapel, and other parts, some highly ornamented, are formed of artificial stone or brick; and are still in excellent repair. Fig. 257, in isome-

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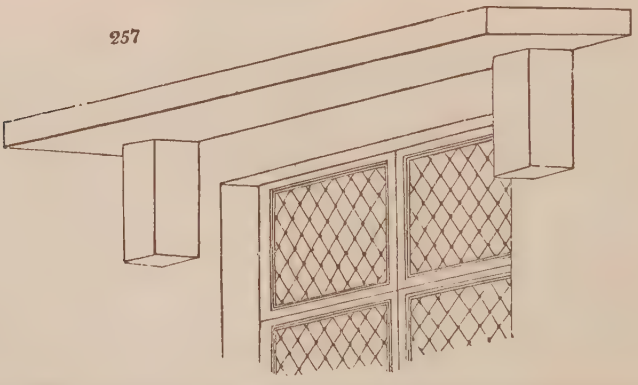

trical perspective, on a scale of a quarter of an inch to a foot, shows the manner in which the shelf is supported over the window in the gable end.

275. *General Estimate.* Cubic contents, 10,818 feet, at 6*d.* per foot, £270 : 9*s.*, at 4*d.*, £180 : 6*s.*; and at 3*d.*, £135 : 4*s.* : 6*d.*

276. *Remarks.* What has the mental architect to say to this building? What is the kind of mind discoverable in the elevation? Certainly it does not exhibit a single feature of vulgarity. The pillars and cornice, and the brackets to one of the windows, have, on

the contrary, a simple and rather elegant appearance. The shapes of the three windows are different, and yet not opposed, and they are in three different positions relatively to the walls and the roof, forming an agreeable variety, or perhaps rather harmony On the whole, we are satisfied with this elevation, and the plan is convenient.

Design XXXVIII.—*A Dwelling of Three Rooms, with a Back Kitchen, and other Conveniences, intended as a Porter's Lodge, or Gardener's House.*

277. *Accommodation.* The ground plan, fig. 258, shows an entrance lobby, *a*; kitchen, *b*; back kitchen, *c*; parlour, *d*; bed-room, *e*; closet, *f*; cellar, *g*; pantry, *h*; dusthole, *i*; privy, *k*; a place for fuel, roots, &c., *l*; and another for bees, exterior to *k*.

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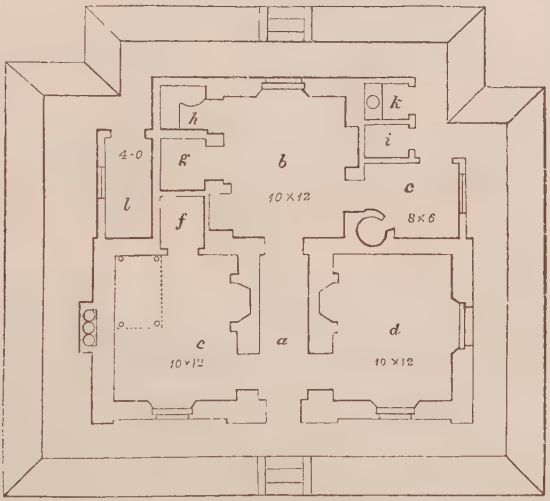
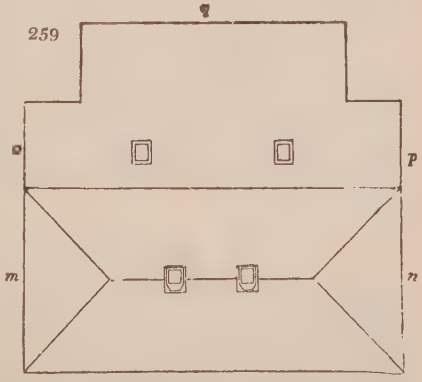


278. *Construction.* The walls are shown of a thickness proper for earth or rubble stone. The roof is in two parts, fig. 259; one part, *m n*, covering the main body of the house; and the other part, *o p q*, being a lean-to at the back. From this construction of the roof, the whole of the water might be easily, and with little expense, collected, and conveyed to a cistern over *k*, or to a tank under *h* or *l*.



279. *General Estimate.* 13,334 cubic feet, at 6*d.* per foot, £333 : 7*s.*; at 4*d.*, £222 : 4*s.* : 8*d.*; and at 3*d.*, £161 : 13*s.* : 6*d.*

280 *Remarks.* The effect of the front elevation is dignified, and the expression, with reference to use, is that of substantial comfort. There does not appear to be much attempt at style. A side or back view would not give so favourable an expression, because a great breadth of lean-to roof has always a mean effect. To counteract this, care must be taken in planting the garden, fig. 260, (drawn to a scale of a quarter of an inch to ten feet,) that trees be so placed as to break the horizontal lines from every point of view whence the lean-to part of the roof can be seen. The simplest mode of effecting this would be by planting a row of trees in the border below the terrace, commencing at *r*, and continued round *s* to *t*: but this would shade the windows, and stagnate the air about the house; and, therefore, a better mode is, to place only a few trees in that situation, and scatter others throughout the garden (but always so as not to impede its

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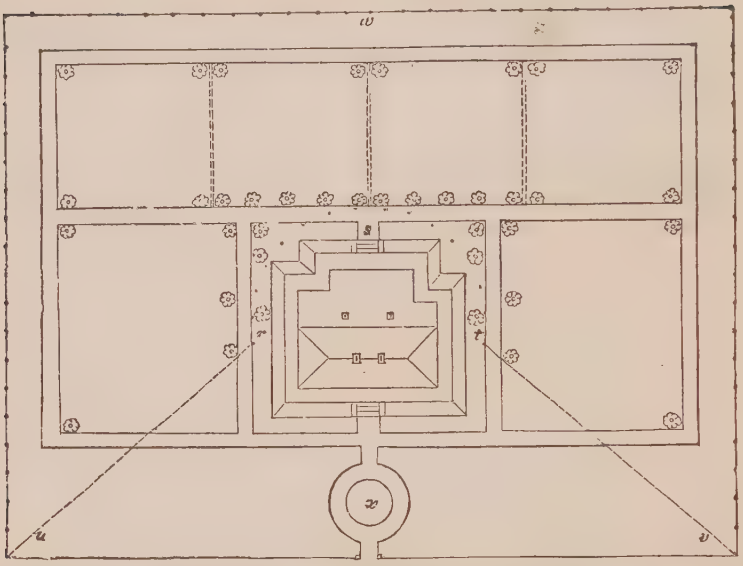

regular cultivation), between the dotted lines *u r*, and *v t*, and the back part of the garden *w*. The reason for the range, precisely within which the trees must be planted, will be sufficiently obvious to all who have the slightest idea of perspective. Trees scattered along the boundary of the garden, from *u* to *w*, and from *w* to *v*, would never disguise any part of the house from a spectator walking along the outside of the boundary, because they would be too near the eye; and trees scattered any where between the dotted lines *u r* and *x*, and *t v* and *x*, would be of no use in disguising the lines of a roof, or indeed any other object, situated between *r* and *s*, or between *s* and *t*. When the view is unconfined, the horizontal range of vision taken by the eye is ninety degrees; and, consequently, a fixed position for the eye being given, the number of trees required to plant out any distant object, filling the whole of this angle, will chiefly depend on the distance of the trees from the eye: on the contrary, when an object, filling a small part only of the angle of vision, is to be concealed from a variety of points, through all of which the eye may range, the number of trees required will increase in proportion to their distance from the object. Thus, it will appear by fig. 260, that sixty-four trees would be required in the boundary hedgerow to hide that part of the house marked *r s t*, from an eye which could range from *u*, by *w*, to *v*; whereas sixteen trees would effect the same object, if placed near the platform on which the house stands. In the case of this garden, we neither recommend the hedgerow, *u w v*, of sixty-four trees, nor the semicircular row, *r t*, of sixteen trees; but, as before observed, we would effect our object by scattering them in the garden at different distances from those parts of the house which are to be concealed.

Design XXXIX. — *Two Dwellings for Country Labourers, under One Roof, with Two Rooms in each, and other Conveniences.*

281. *Accommodation.* The ground plan, fig. 261, shows the following accommodation for each cottage: — a projecting open porch, *a*; entrance lobby, *b*; kitchen or living-room, *c*, with a closet under the stair; back kitchen, *d*, from which the whole might be heated; place for fuel or roots, *e*; privy, *f*; and cow-house, *g*. On the chamber floor there are one good bed-room and a closet to each dwelling. There is a small yard to each cow-house, with a pigsty, *h*; dung-pit, *i*; and a liquid manure tank, *k*. There is a grass-plot to each cottage; and a garden in front, and along one side; behind may be a grass field or lawn.

282. *Construction.* "The walls," observes our contributor, "may be of stone, or mud; the roofs may be thatched with straw or reeds, and wattled down at the ridge with hazel rods, as shown in the elevation. The windows may be latticed, having the lintels, sills, and rabbet-heads, &c. plastered (the rabbet-head of a window is a Scotch

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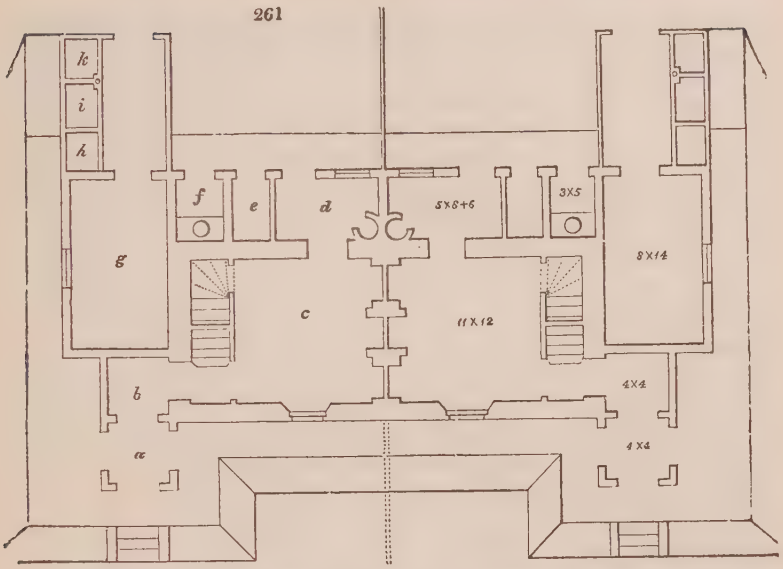
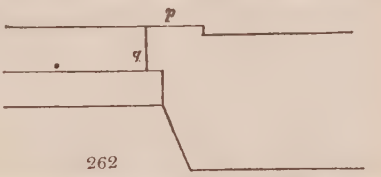


term for what in England is called the reveal of a window, viz. *p*, in fig. 262; and what in Scotland is called the back-filled rabbet, or the back-filled rabbet-head, is in England called the facing, or architrave, viz., *q*, in fig. 262, projecting an inch all round. This term is, however, only applied to plain facings round doors and windows externally; for, when the facings round both the exterior and interior openings are moulded, they are called, as in England, "architraves." Fig. 263 is a section across the chamber floor, to show, that a part of the height of the bed-rooms is obtained from the roof.



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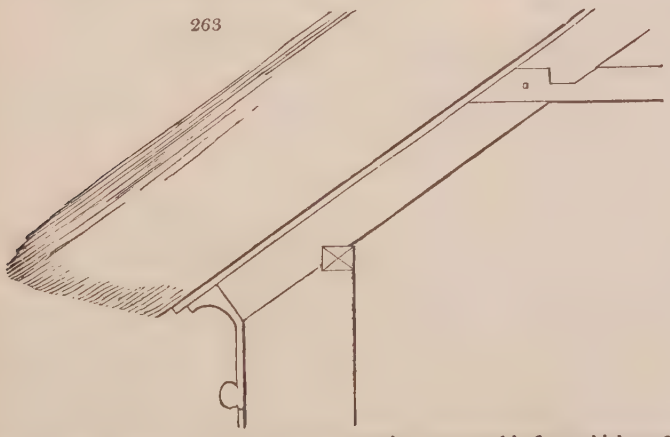

283. *General Estimate.* The two houses contain 12,986 cubic feet, which, at 6*d.* per foot, is £324 : 13*s.*; at 4*d.*, £216 : 8*s.* : 8*d.*; and at 3*d.*, £162 : 6*s.* : 6*d.*

284. *Remarks.* There is an appearance of comfort about these cottages, and yet there is something mean in the roof slouching down over the two bed-room windows. The manner of roofing the lean-tos is alto ether bad; a gutter against a gable-end wall

is almost certain to leak, or to become choked up, more especially when the roof is thatched. The building, however, is so far expressive of its purposes, that it can never be mistaken for any thing else than a cottage; and, on the whole, is rather picturesque than otherwise.

Design XL. — *Two Cottages of Three Rooms each, under the same Roof, with Cow-house, Pigsty, and other Conveniences to each.*

285. *Accommodation.* Each dwelling contains a porch, *a*; kitchen, *b*; back-kitchen, *c*; dairy, *d*; store closet, *e*; two bed-rooms, *f* and *g*; privy, *h*; place for fuel, *i*; pigsty, *k*; and cow-house, *l*. Where neither cows nor pigs are kept, the cow-house may, with propriety, be used as a root-cellar and place for fuel, and the pigsty as a dusthole; or, *k* and *i* may be got out of the space occupied by *l*; and thus the whole of the conveniences required may be obtained under one simple parallelogram roof.

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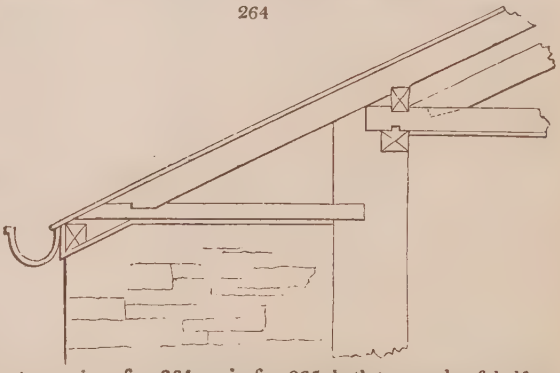
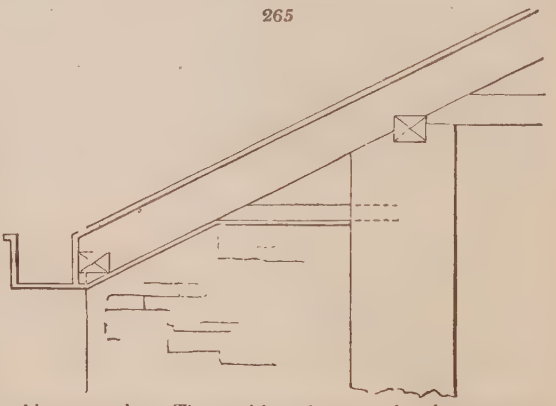


286. *Construction.* The walls are shown of such a thickness as to admit of their being constructed of stone, or of earth, and the roof may be of slate: the eaves, where the roof projects over the porch, are supported in the manner exhibited in the section, fig. 264, or in fig. 265, both to a scale of half an inch to a foot, as double or single rafters may be required.

265



287. *General Estimate.* Cubic contents, 26,304 feet, at 6*d.* per foot, £657 : 12*s.*; at 4*d.*, £438 : 8*s.*; and at 3*d.*, £328 : 16*s.*

288. *Remarks.* Considered as the lowest description of cottages, for country labourers these dwellings are commodious, and are calculated for being executed at a moderate charge. The walls in the ground plan are shown of more than the usual thickness, because they are supposed to be built of earth, with the exception of the chimney stacks. The partitions between the closets may be formed of brick nogging on edge, fig. 266. The floors may be paved with bricks, tiles, or flag stone; or formed of gravel or mortar mixed together, and laid down immediately, then beat smooth, and covered with a thin coat of cement. Of whatever earthy materials the floors are made, they must be heated by a flue from the back kitchen; because, otherwise, the dwelling would be cold and uncomfortable in winter. This flue will not require the fire to be lighted more than two or three times a week; because, if the floor be constructed as directed in describing Design I., it will retain the heat communicated to it by the flue for several days. If the floors be made of boards, the flue may be dispensed with; because, in that case, there will be a vacuity between the boards and the soil of, at least, two feet. The bottom of this vacuity should be,

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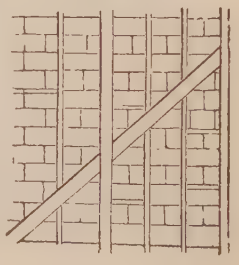
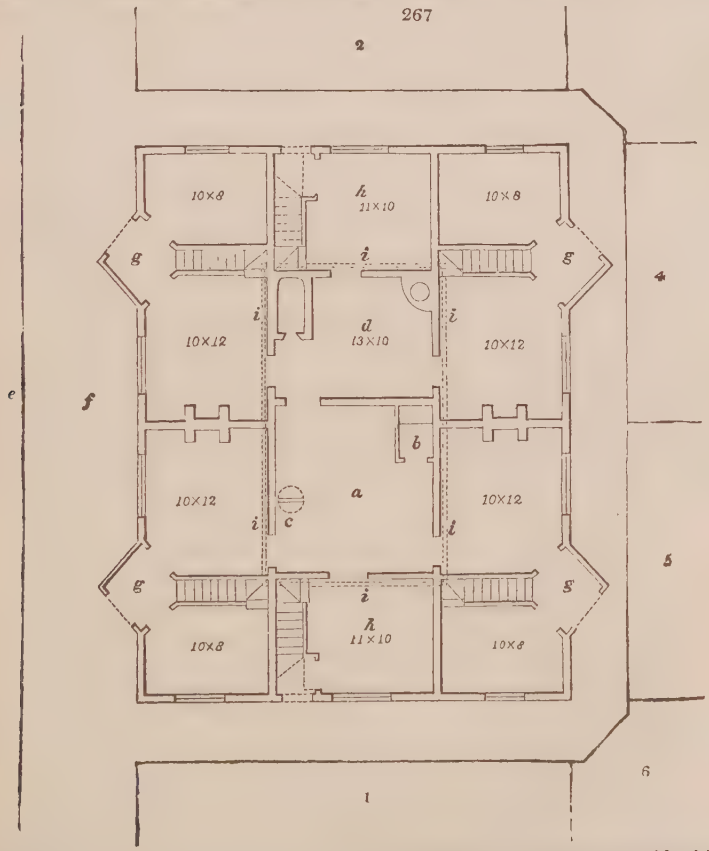


at least, one foot above the surrounding surface, in order that no water may ever drain into, or rest upon it. Each cottage should have a yard behind it, surrounded by a wall of earth, with a projecting coping of slate, tile, or boards, and the entrance to this yard may either be at one side, or behind, according to the arrangement of the walks of the garden. It is almost needless to observe that there ought to be a dung-pit and liquid manure tank in each yard, communicating with the privy by a pipe-drain; and, where superior cleanliness is an object, this drain should communicate with the cow-house and pigsty in the same manner.

289. *Ornament.* These dwellings may be ornamented with handsome chimney pots; by covering the roof with a trellis for vines; by adding another pillar to each porch; and by a handsome architectural parapet. Supposing the slope of the parapet not to be less than forty-five degrees, and covered with turf, and the upper part gravelled, with a margin of turf of about a foot in width, the effect from the surrounding garden would be exceedingly good, without any other addition than the chimney-pots.

Design XLI. — *Six Cottages grouped together, with a view to Economy in building them.*

290. *General Arrangement.* The object of this Design is, to show the manner in which dwellings may be erected with the greatest degree of economy. We have before observed (§ 23), that, where this is the case, the external form will always approach more or less to that of a cube, and the internal apartments will also approximate to this figure. In the Design submitted, figs. 267 and 268, six dwellings are ranged round an



open yard, *a*, which contains a privy, *b*, and well, *c*, common to the whole; beside this is a wash-house and bake-house, *d*, also common to the whole. The building is two stories high, each story being eight feet high in the clear.

291. *The situation of this group* may be supposed to be near a public road, *e*,

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separated from it by a small area, *f*, which may either be left open for a play-ground for children, or laid out as a drying ground, or flower-garden. The six kitchen-gardens are indicated as ranged on three sides of the building, and the whole space occupied by the dwellings and gardens need not, in ordinary cases, exceed one acre. The accommodations of the separate dwellings vary from two to four rooms each. The place for a wash-house and bake-house is intended to be used in rotation by each family, so that it will be employed as a wash-house and bakehouse six days in the week, and as a bake-house only on the Sunday morning. One of the cottagers may have the general management of the wash-house and of the oven; and this management may either be taken by all in turn, or a small payment be made for it monthly by all to one, &c.

292. *Accommodation of each Cottage.* The four dwellings, marked *g g g g*, contain each a principal room ten feet by twelve feet, and a small room of ten feet by eight feet, on both floors, with a closet under the staircase. The two dwellings, marked *h h*, contain each a room ten feet by twelve feet, on both floors, with a closet under the staircase.

293. *Construction.* The walls are supposed to be built of brick, and the roof slated. If, instead of brick, timber were used, there would, at the present price of British timber about London (£3: 10*s.* per load of fifty cubic feet), be a saving of from £50 to £60 on the six dwellings. In this case, all the exterior and foundation timber ought to be oak, but the rest may be of any description of wood of British growth. The floors of both stories are to be of deal boarded; the windows of latticework in iron frames, and the covers to the entrance porches of slate slabs.

294. *Specification and Estimate.* These are here combined; the building being of so simple a description, that a separate specification is not considered necessary.

295. *Bricklayer, Plasterer, and Slater's Work.* The bricklayer is to build the walls externally, and the division walls between each cottage, of one brick in thickness, with three courses of footings, one foot and a half thick. The openings of the chimneys on the ground floor to be two feet six inches wide, with jambs of one brick in thickness; and the chimneys of the chamber floor to be one foot six inches wide, with half-brick trimming arches. The space under each staircase to be paved, and enclosed with brick-work one foot six inches high, and half a brick in thickness.

	£	*s.*	*d.*
Fifty-three thousand bricks, per thousand 38*s.*			
Six and a half bushels of lime for every thousand of bricks, at 8*d.* per bushel, is, per thousand of bricks, 4*s.* : 4*d.*			
Road drift (the scrapings of roads, being stone or gravel, ground to powder by the traffic on the road, and therefore become a sort of sand,) or pit or river sand, for every thousand of bricks say 2*s.* : 2*d.*			
Labour for every thousand of bricks, 8*s.*			
In all, per thousand of bricks, £2 : 12*s.* : 6*d.* which for 53 thousand is (The above price is equal to £11 : 5*s.* per rod of brickwork.)	139	2	6
Digging the foundations	2	10	0
Twelve chimney pots, and setting them, at 4*s.*	2	8	0
Twelve cast-iron fronts to the fireplaces, five eighths of an inch thick, four inches wide, with slabs half an inch thick, and one foot six inches wide, at 13*s*	17	16	0
Twenty stone sills to the windows, at 6*s.*	6	0	0
One hundred feet lineal of ridge tiles, at 4*d.*	2	16	0
Eighteen squares of countess slating on the roof, at 25*s.*	22	10	0
As slating is the lightest covering, and the cheapest in most parts of England at the present time; it is preferable to tiles.			

	£	s.	d.
Thirty feet superficial of half-inch slabs over the entrance porches, at 1*s.* per foot	1	10	0
Two cwt. of milled lead for valleys, at 30*s.*	3	0	0
Two hundred and thirty-three yards of plaster, set and whited on lath, to the ceilings, at 1*s.* : 3*d.*	14	6	3
Seven hundred and fifty-five yards of plaster, set and whited, to the walls, at 7½*d.*	23	11	10

296. *Carpenter's Work.* The timber may be of larch, elm, or any other timber of equal durability. The rafters of the roof are to be four inches by one and a half inches. The ridge pieces, hips, and valleys, to be seven inches by one and a half inches. The ceiling joists to be four and a half inches by one and a half inches. The joists to the floors to be seven inches by two inches. The plates to the roof, to the floors, and to the angle ties, to be four inches by four and a half inches. The lintels to be four inches by three inches. The wooden bricks for fitting joiner's work to the brickwork to be four inches by two and a half inches. The door-frames to be four inches by three inches. Eleven and a half loads of timber delivered £3 : 10 : 0
Sawing the same, per load 0 : 10 : 0
Labour and nails, per load 1 : 5 : 0

In all, per load 5 : 5 : 0

which, for eleven and a half loads, is	63	0	0
Fourteen squares of three-fourth-inch battening for slates, at 12*s.*	8	8	0
One hundred and seventy feet superficial of three-quarter-inch eave boards, at 4*d.*	2	17	0
Seventy-six slip centres for the openings, at 1*s.*	1	6	0

297. *Joiner's Work.* The joiner's work for these dwellings is calculated on the supposition that deals twelve feet in length, three inches thick, and nine inches wide, cost, when delivered, per 120, £36.

Twenty-six squares of three-quarter-inch deal wrought floors, at 31*s.*	40	6	0
Two hundred and fifty-five feet superficial of three-quarter-inch deal skirting, 5½*d.*	5	16	10
Twenty-three and a half squares of five-eighth-inch deal matched (the edge of one board grooved, and the adjoining board tongued, with a pair of planes fitting into each other, called match planes), and beaded boarding, planed on both sides, for each side of the stairs, at 34*s.*			
Latches and bolts to twenty-four doors	4	4	0
Ten one and a half inch deal two paneled square doors, each measuring twenty-four superficial feet, and each having a latch and a bolt, with stops, and hung with three-inch butt hinges, to be provided for the rooms on the ground floor, each door complete, at 23*s.*	11	10	0
Twelve one and a half inch two paneled bead butt, and square outside doors, each measuring sixteen feet three inches superficial, and each having a lock, latch, and oak sill, with half-inch lining to the frames, and hung with three-inch butt hinges, at 25*s.*	15	0	0
Twelve three-light frames to the windows, and eight two-light frames of one and a half inch deal five inches wide, framed, rebated, and beaded; the whole containing four hundred and sixty-four feet lineal, including the fitting in of the lights, at 6*d.*	11	12	0
Twenty-six lifting shutters for the windows of the ground floor of five eighths of an inch deal, ledged; each shutter measuring four feet six inches superficial	4	8	0
Twenty iron casements and fastenings	3	10	0
Six staircases of inch deal, housed into one and a half inch strings, and framed newels and handrails	15	0	0

298. *Glazier's Work.* Fifty-two lights glazed with quarries, each measuring six feet superficial, at 1*s.* : 6*d.* 19 : 10 : 0
Ninety-six saddle bars to the lead lights 1 : 4 : 0

299. *Painter's Work.* The woodwork to be painted four times in oil colours 35 0 : 0

	£	s.	d.
300. *Sundries.*—The erection of the wash-house will amount to.....	16 :	8 :	0
Oven and copper.....	14 :	0 :	0
Well, fifty feet deep, including bucket and tackle.....	30 :	0 :	0
Erection of a privy	5 :	0 :	0
Fifty feet of drain	2 :	10 :	0
Two hundred and forty-three feet lineal of three-quarter-inch deal, planed, to the eaves, soffit, and fascia.....	4 :	9 :	0
Two hundred and forty-three feet in length of cast-iron gutter to the eaves.....	7 :	1 :	9
Seventy-two feet lineal of two-inch cast-iron pipe	2 :	8 :	0
Six heads and six shoes to the pipe, and four angles to the gutter ...	2 :	1 :	0
Total (£98 : 10*s.* . . 10¼*d.* per dwelling, or)	£ 591 :	5 :	2

301. *The aforesaid prices* are prime cost; but if a builder be employed, a profit must be added, according to the mode of payment.

302. *Remarks.* For the foregoing very economical and convenient design, specification, and estimate, we are indebted to Mr. W. Laxton, Surveyor, Holborn Bars, London; well known among professional men as the author of *Laxton's Builder's Price Book*. We have given it exactly as received, in order that the specification and estimate might apply to the engravings; and we shall now show how we think it might be improved; though, of course, by adding to the expense. The first thing which we shall suggest is, the building of the walls with brick on edge, in the manner of Dearn or Silverlock, both to be hereafter described. According to Dearn's mode, a saving of one third in the number of bricks would be obtained, at once deducting £46 : 7*s.* : 6*d.* from the estimate, besides producing walls which would keep the apartments within warmer in winter, and cooler in summer. By raising the general floor of these dwellings two feet or three feet above the level of the surrounding surface, according to the nature of the soil and subsoil, and by having the oven in a sunk area three feet deep, a flue might be conducted from it under the ground floor of every apartment, as explained under Design I., § 34. Over the oven might be placed a box boiler, from which a flat tube, six inches by three inches, might be conducted horizontally under the floors of all the rooms on the ground floor; by which they would be sufficiently heated. If an underground smoke flue were employed, it would be necessary to have the floor paved, at least in part, with tiles or flag stones; but if a hot water pipe were conducted round the building, in the direction of the dotted line *i i i*, in fig. 267, a boarded floor might be used.

303. *Privy.* In the yard there ought unquestionably to be two privies, one for each sex; and these might, at a very little expense, be rendered water-closets; not by a cistern over them, the water in which would be liable to be frozen in winter; but by a cistern in the wash-house, which would, at the same time, supply water for washing and other purposes. Basins should be placed in the privies, as shown in fig. 13, § 28, and, in order to prevent the waste of water, an arrangement may be made only to admit a little to the basin, every time the door is opened and shut. For this purpose, in addition to the simple and efficient plans described under § 39. we shall here exhibit a less perfect one employed in the British Museum. In this example, which will be understood from fig. 269, as soon as the door of the water-closet is opened beyond a right angle, the

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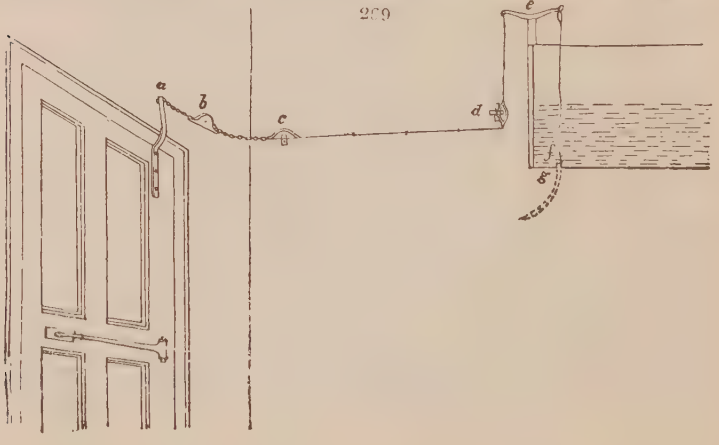

wrought-iron rod fixed on it at *a* pulls the brass chain through the pulley *b*, that communicates with the crank *c*; to which a wire is attached, that runs along as shown in the figure, between *c* and *d*. The crank *d* pulls down the lever *e*, which lifts the valve *f*, and consequently admits the water from the cistern through the small pipe *g*, to the basin. Fig. 270 shows the brass pulley, *b*, on a large scale. Fig. 271 represents

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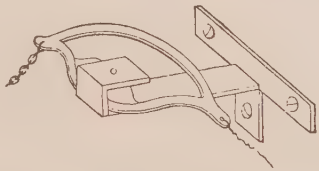
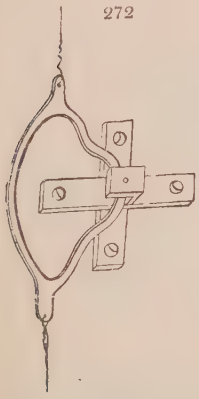


the crank *c*, also on a large scale. Fig. 272 is an enlarged view of the crank *d*. The cross pieces of the cranks for the reception of the screw nails are of iron japanned, and the other parts of the cranks are of brass. Fig. 273 represents the wrought-iron rod *a*, which is fixed on the door, and to which the chain is attached. Fig. 274 shows the spring

272



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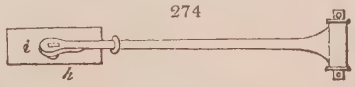
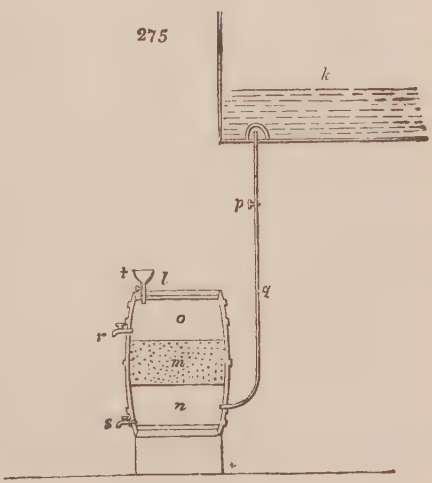


that shuts the door, in which *h* is a roller moving on the iron plate *i*, nailed to the door. It is almost superfluous to add that the whole of the water of the roof may be conveyed to the supply cistern, by connecting the outer eaves' gutters with the inner ones, by means of pipes carried along the party walls, immediately under the roof; that one of Siebe's pumps may be used for supplying this cistern in times of great drought; or that the water, when filtered, may be preserved cool in an underground tank. § 151, fig. 119.

304. *Manure Tank.* The importance of manure to a cottager's garden ought never to be lost sight of; every means ought to be made use of to collect it; and for this purpose not a drop of soap-suds or of foul water ought to be lost; but the cess-pool, provided in this design, is much too small, and very inconveniently situated for being emptied; not to speak of its proximity to the well of pure water. We would recommend a larger cess-pool in one of the gardens, connected with the one in the yard by a barrel drain, and conveniently situated for distributing its contents among the different gardens. We recommend attention to what we have before observed on this subject, when describing Design I.

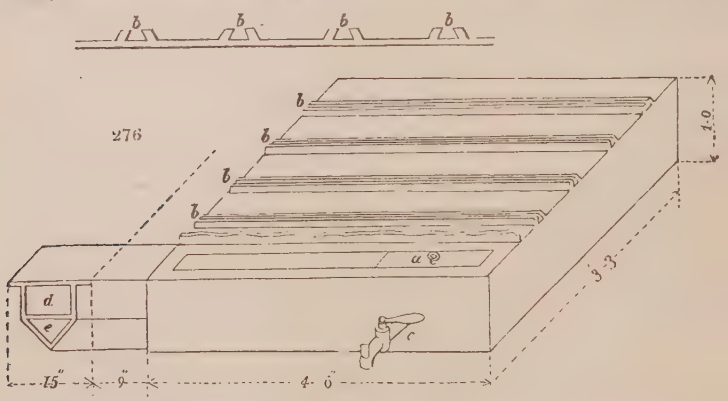
305. *The Cistern* in the wash-house should be raised at least eight feet from the floor; and, besides supplying the water-closets, it may communicate with a filter of a simple construction, from which water may be drawn at pleasure for the purposes of cookery or washing. This filter may be thus constructed:—Fig. 275, *k*, represents the cistern; *l*, a cask; containing the filtering material at *m*, a space for the deposition of impurities from the water to be filtered, at *n*, and for the filtered water at *o*. This cask is connected with the supply cistern by the pipe

275



q, which, having a stopcock at *p*, water may be admitted to *n* at pleasure; and this water, by the pressure from that in the cistern, will speedily rise through the filter, *m*, to the space, *o*; from which it may be drawn off by the cock, *r*. There is also a cock, *s*, for drawing off the water from *n*, when it is desired to clean the filter, which may be done by allowing the water from *o* to descend. It may be observed, that if at any time, there should be a deficiency of water in the cistern, *k*, water from any other source may be filtered from the barrel, *l*, by the following means: —First, the filter, *m*, may be cleaned by pouring in water at the top of the cask through the funnel, *t*; and afterwards water from the well, or any other source, may be poured into *o*, and drawn off by *s* for use, till the cistern, *k*, is again supplied from the roof. A wooden or copper bath may be placed in the wash-house; which may be supplied with cold water from the filtering cask, or with hot water from the cistern over the oven, or from the washing and brewing boiler. The brewing utensils may also be deposited in this part of the building, and may be used in common.

306. *A Drying-Closet*, by another slight arrangement, might be formed over the oven; all that is necessary for this purpose, being to have the cast-iron box containing the water, fig. 276, made rather larger than the bottom of the closet; that part of the cover of



the boiler which forms the bottom of the closet being made perfectly watertight, and the boiler having an exterior opening at *a*, for the purpose of supplying it with water, and to admit of the escape of steam when the water boils. The portion of the cover of the boiler which forms the bottom of the closet may have grooves, *b b b b*, cast in it, or riveted to it, or to a false bottom, at six inches' distance from each other; in which grooves may slide clothes-horses, to hold the clothes to be dried. There should be a large cock for drawing off the water at *c*; and, from the side which will be placed next the wall, a conducting or outgoing tube, *d*, and a returning one, *e*, for the circulation of the hot water round the building. The upper surface of the outgoing pipe will be on a level with the floors of the rooms, and form part of them; and the projections of three inches on each side of this pipe are pierced with holes, to permit the heat from the sides of the tubes to rise into the rooms. Over the grooved surface of the boiler a closet may be formed, five or six feet or more in height, three feet wide, and four or five feet long. This would admit of four clothes-horses standing side by side, at six inches apart; and by a small opening in the bottom of the door (say half an inch in depth, and the whole of its width), with a corresponding opening in the ceiling of the closet at the opposite end, a current of air will be produced, which will rapidly convey away the moisture from the clothes. This arrangement would not in the least interfere either with baking in the oven, heating all the dwellings with hot water, or supplying hot water for ordinary uses, as the following figures will show: — Fig. 277 is the foundation plan of the wash-house, in which the oven, *f*, is retained in the same position as in fig. 267, but varied in size, and sunk lower; *g* shows the steps down to it; and *h* is the area for fuel. Fig. 278 is a surface plan, showing the drying-chamber, *i*, over the oven, and the boiler for washing and brewing, *k*. Fig. 279 is a section on the line A B, of the plans figs. 277 and 278, in which are shown the steps down to the oven, *l*; the hot-water box, *m*, and hot-air closet over it, *n*. Fig. 280 is a section of fig. 278 on the line C D, in which are shown the oven, *o*; the hot-water box over it, *p*; the hot-air closet, *q*; the opening under the door, *r*; and the other opening near the ceiling, *s*. Fig. 281 is a section on the line E F of fig. 278, showing the front of the hot-water plate, *t*, the cock for drawing

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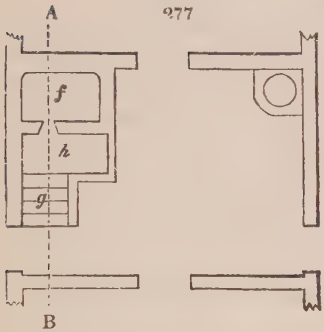

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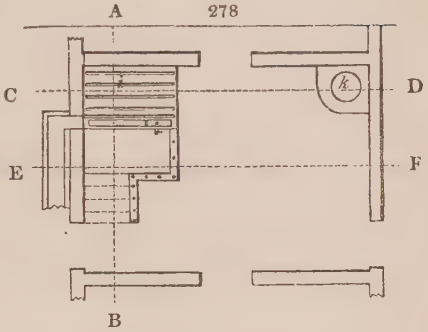

off the water, *u*, and the two pipes for circulating it, *v* and *w*. The hot-water box may be either of cast-iron in one piece, or of riveted plates of iron or copper. It may be

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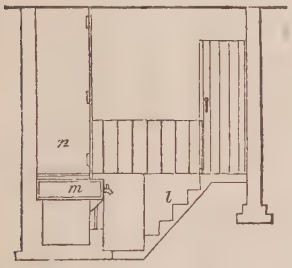

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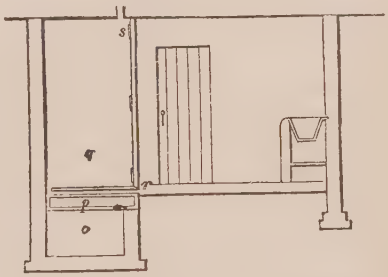

mentioned, that it would be an improvement to have what may be called a false bottom to the closet, made of iron, or even of wood, to which the grooves might be attached,

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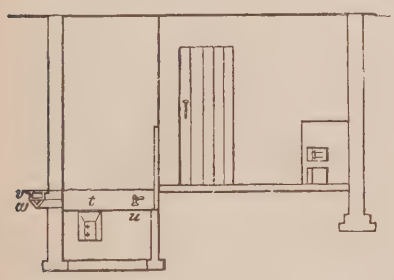

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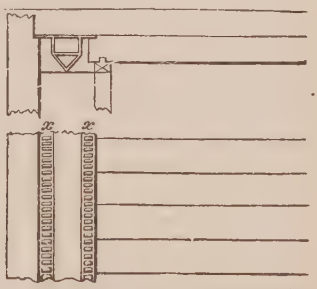
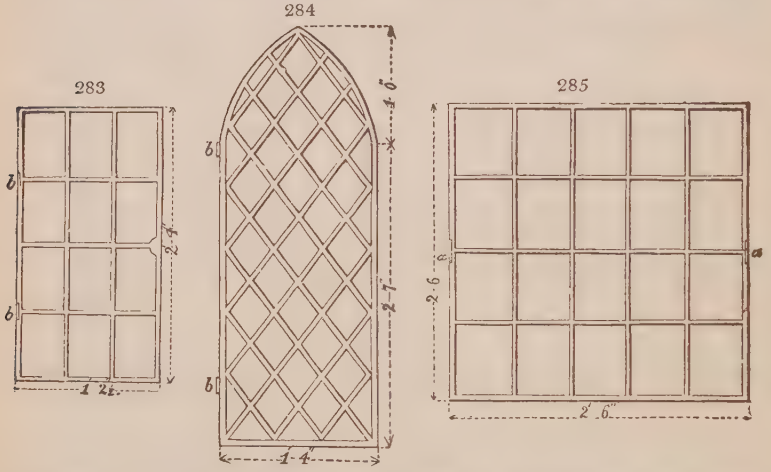


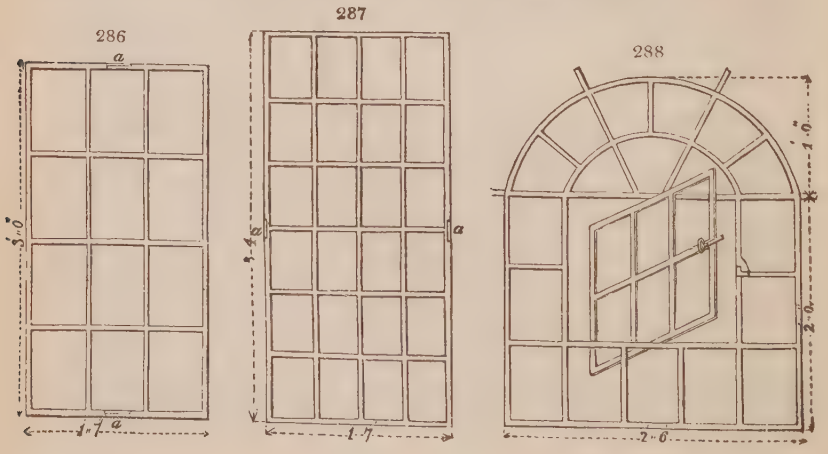
and placed about an inch above the top of the boiler, with an opening (of about half an inch in depth, and the whole width of the closet), at the door, for the admission of the air to be heated, and another at the opposite end, about twice the size, for the escape of the hot air into the closet. The effect of this arrangement would be, to carry off more heat from the cover of the boiler, and consequently to make the closet hotter. The principle has been illustrated in Perkins's steam-generator, as described in the *Mechanics' Magazine*, vol. xvii. This pipe for circulating the water should be of iron; and it would be an improvement to have the upper one square, or at least flat at top, about nine inches wide, with projecting flanches of grating, as in fig. 282, so that when the whole was laid down, painted of the colour of deal board, and completed, it might appear ornamental rather than otherwise. The grating on each side of the pipe, *x x*, in fig. 282, it is almost needless to observe, is to admit heat from the under pipe. By having the upper surface of the outgoing pipe no higher than the level of the floor of the apartments, no interruption is offered to the opening of the different doors which pass from the dwelling-rooms into the yard or to the wash-house. The low position of the pipes will also heat the air of the rooms more effectually than if they were higher; and,

so placed, they will be found convenient for warming the feet, and for keeping vessels of water or of food hot. Those who are acquainted with the mode of heating hot-houses by hot water will allow that there is not the slightest degree of difficulty either in erecting such an apparatus, in the first instance; or, when erected, in managing it, and keeping it in repair; and further, that, by it, it would be easy, in the most severe weather of even a Russian winter, to maintain a temperature of 60° and upwards in all the rooms on both floors of this group of cottages.

307. *Windows.* We do not like latticed windows, because they are generally cold and gloomy; but as they are much cheaper than sashes hung with cords and pulleys, where economy is a main object, recourse must either be had to them, or to iron windows. Windows of cast iron, very fit for cottages, are now made, of different forms, and very cheap. Fig. 283, which is one foot two inches and a half wide, and two feet four inches high, and weighs 8 lbs., costs in London, in 1832, by retail, only 3*s.* 6*d.* Fig. 284, in the Gothic form, which is one foot four inches wide, and three feet 7 inches high, weighs 23 lbs., and costs 6*s.* Fig. 285, two feet six inches square, weighs 19 lbs.,



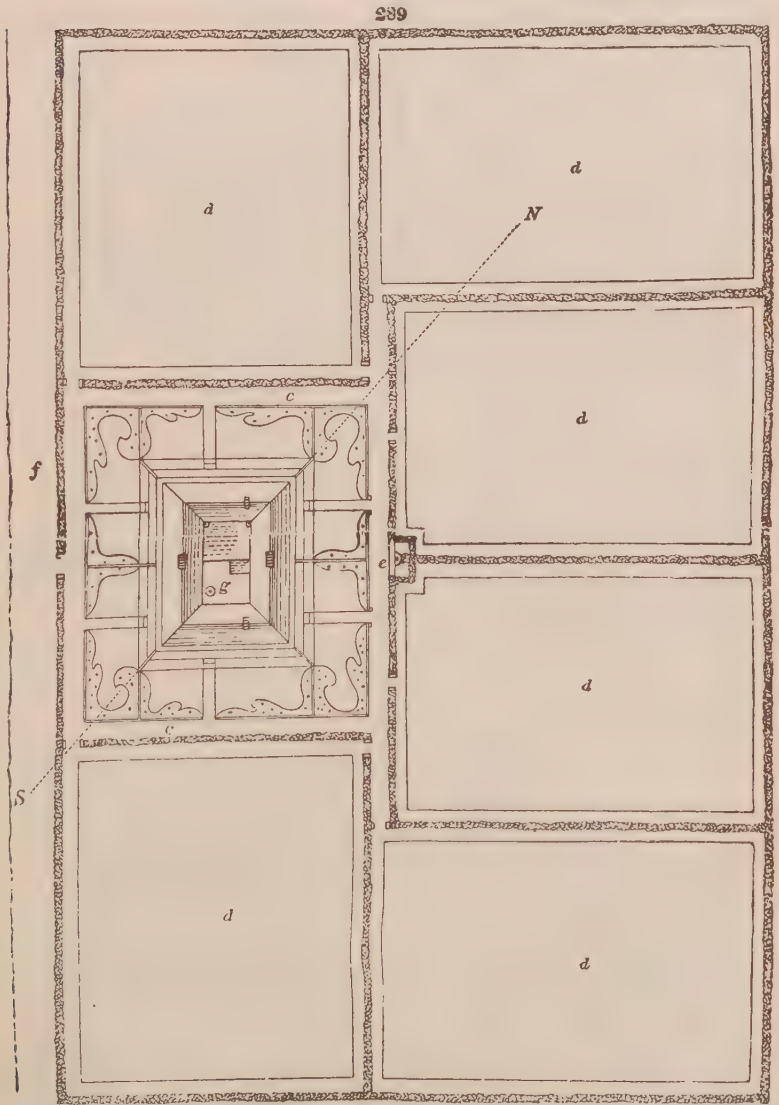
and costs 6*s.* 6*d.* Fig. 286 is one foot seven inches wide, and three feet high, weighs 11½ lbs., and costs 5*s* 6*d.* Fig. 287 is one foot seven inches wide, three feet four inches high, weighs 20 lbs., and costs 6*s.* 6*d.* These windows have each, either ears in the centre, as at *a a*, figs. 285, 286 287, by which they may be suspended, so as to open outwards at bottom, and inwards at top, or the contrary; or they have side-ears, to which hinges may be riveted, as at *b b*, in figs. 283 and 284. Fig. 288 is a superior description of



cottage window: it is two feet six inches broad, three feet high, weighs 34 lbs., and costs 15*s*. This sash is calculated for being fixed in the masonry, having in the centre a square of six panes, which opens for the admission of air. As it requires no window frame or hinges, it must be a very cheap substitute for the sash window. Mr. Laxton appears to have chosen the cheapest of these casements; but, where ornament or style is thought worthy of attention, the Gothic or Grecian headed iron sashes, figs. 284 and 288, would still be found economical.

308. *Gardens.* We do not think it desirable that there should be a walk round this building close under the windows, because it would have a tendency to destroy privacy. We would rather give a small flower-garden or grass-plot, to each house, separated by low walls, and forming separate entrances through each plot, as shown in fig. 289. We

289



would by all means raise a terrace, two steps high, and four feet broad, round the whole, so as that the building might seem to stand elevated a little above the general surface; and this would give the grass-plots or flower-gardens a slope outwards towards the walks

c c, &c. As the floors in the original plan, figs. 267 and 268, are already two steps above the surrounding surface, this terrace will occasion no other expense than the proper disposal of the earth which comes out of the foundations, the well, and the cess-pools. The kitchen-gardens, *d d*, would remain in the same positions as in fig. 267. We have shown a walk, four feet broad, round each garden, under the hedge, which may be of fruit trees, and we have placed the liquid manure tanks, *e*, in a situation which will be central to all the gardens. The emptying of these tanks should belong to each occupier in rotation. Nothing but useful plants and fruits will require to be grown in the large gardens, *d d*, &c., because the borders round the grass plots will be sufficient for flowers and ornamental plants. In order that this building may have a proper aspect, the diagonal of the parallelogram should form a north and south line, fig. 289, S N, (see § 24); however much the line of the front of the building may diverge from the line of the road. All that is necessary in this case is to include the building and its gardens in a parallelogram, one side of which coincides with the line of the road, as in fig. 290, in which *f* is the public road, and *g* is the building, in a parallelogram of exactly the same size as in fig. 289. Here it will be observed that the north and south line is at right angles with the public road.

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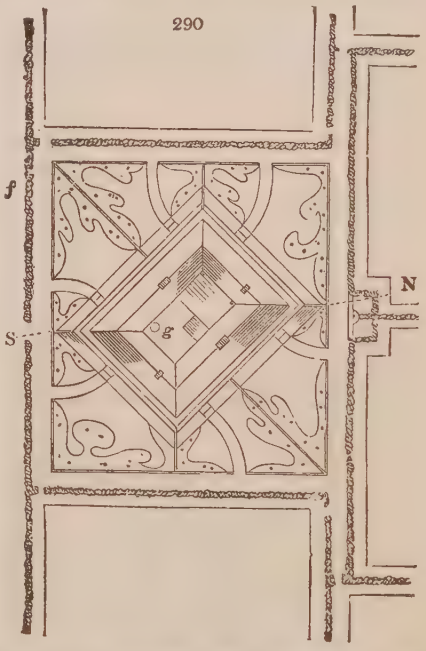

309. *Ornament.* This building might be decorated, by surrounding it with a veranda, or a penthouse roof, which would give to each dwelling a covered walk during rain, or a hot mid-day sun, or under which clothes, herbs, or Indian corn, might be dried. The roof of this veranda or penthouse might be slated like that of the dwelling; and this would supersede the necessity of covering the entrance lobbies with slabs, as in fig. 267. Suppose the whole building surrounded by a penthouse roof; brackets placed under the eaves of the principal roof; Tuscan tiles used, and the common chimney pots supplanted by ornamental ones; the effect of the

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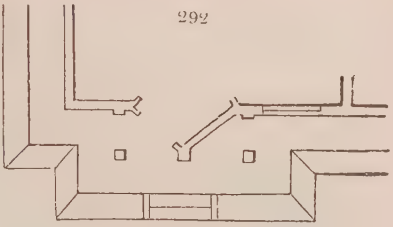
whole would not be unpleasing, fig. 291. Or if, instead of a veranda, Gothic porches were added to each entrance, as in the plan, fig. 292, and Gothic labels were placed over the lower windows, a Gothic character given to the doors, and to the cast-iron grating, and Gothic chimney pots added to the chimney tops, something ornamental in a different style would be produced, fig. 293.

292



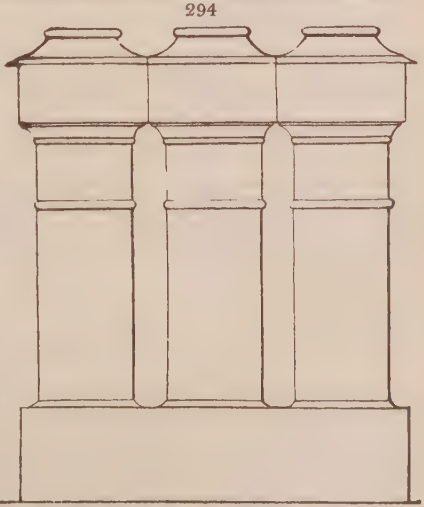
293

Design XLII.—*A Cottage of Three Rooms, in the Elizabethan Style.*

310. *Accommodation.* From a porch, *a*, there are two entrances; one to a kitchen, *b*, with two light closets, *c*, *d*; and the other to a parlour, *e*, and a bed-room, *f*, with a closet, *g*. No out of door conveniences are shown; and they must therefore be supposed to be placed in a yard, at a short distance from the dwelling.

311. *Construction.* The walls are supposed to be of stone, and the roof covered with grey slates. The openings of the windows are shown with plain architraves or facings; the sashes are modern, and hung with weights and pulleys. The porch is supported by a wooden column, which rests upon a square stone plinth, and has a plain capital. The chimney pots may be formed of cement, agreeably to fig. 294. The platform or terrace may either be finished with turf and gravel, or paved, as in Design XXXII., as may be most convenient in the given situation.

294

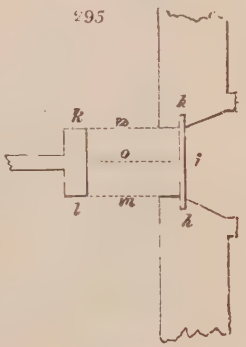


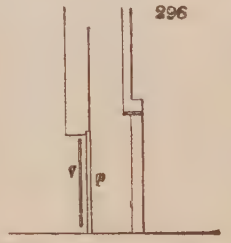
312. *General Estimate.* Cubic contents, 13,615 feet, at 6*d.* per foot, £340:7*s.*:6*d.*; at 4*d.*, £226:18*s.*:4*d.*; at 3*d.*, £170 : 3*s.* : 9*d.*

313. *Remarks.* This is evidently an ornamental cottage, and certainly possesses some characteristics of the Elizabethan style. Were a cellar floor added, and the stair to it made in the closets *c* and *g*, the accommodation and convenience would be greatly increased; a small stair might be continued from the same situation to the roof, the space in which, as exhibited by the section, might be applied to various useful purposes. A garret, where there is a sufficient number of openings for ventilation

may always be made use of in the winter season for drying clothes, and in summer for drying green herbs, or seeds in the pod. In the larger houses in many parts of France, and in both large houses and cottages in most parts of Germany, clothes are always dried in the garrets. A decided improvement to this cottage would be an alteration in the position of the kitchen fireplace; by which means, by having a cast-iron back to it, it might be made to heat both the bed-room, *f*, and the parlour, *e*; either, or both, at pleasure. We do not think this mode so effectual as that by a flue under the floor, which, if a cellar story were added to this cottage, might be most conveniently adopted; but as it may be useful in the case of cottages with boarded floors, or with earthen or paved floors, so low, or otherwise so circumstanced, as that flues cannot be made in them, we shall show how the alteration may be made.

314. *Heating from the Back of the Kitchen Fire.* Suppose the fireplace of *b*, in Design XLII., to have a cast-iron back, three feet square, and that six inches of each end are built into the brickwork, as at *h h*, in fig. 295, then it is evident that whenever there was a good fire at *i*, a great portion of heat would be communicated to the space behind *o*; and that this heat might either be allowed to escape freely into both rooms, *k* and *l*, or confined by two doors, *m* and *n* (which may be wood), so as to admit the whole of the heat to either room at pleasure. By having a central door or movable partition in the situation of the dotted line marked *o*, the heat may either be equally divided between the two rooms, or half the heat may be admitted to one room, and none to the other, &c. By enlarging the size of the enclosure behind the cast-iron back, and by having an opening at the bottom of the doors, and another at the top, connected with an air flue in the wall, clothes may be dried in this closet with the greatest rapidity, and with very little labour. To increase the quantity of heat produced from these plates, when clothes are to be dried, or on other occasions when an extra-quantity of heat may be desirable, it is only necessary to place a plate of sheet iron, or a large slate, or even a well-seasoned board, at the back of the cast-iron plate, and separated from it about one inch; the plate being raised from the floor at the bottom, so as to leave a vacuity of half an inch, and another vacuity of the same dimensions should be left at the top, as represented in the section through both plates, fig. 296. The use of this additional plate is to confine the heating power or radiation of the cast-iron plate *p*, in fig. 296, and thus create a current in the vacuity *q*, on the same principle that water is boiled with greater rapidity in one of Perkins's double-bottomed boilers than in a common kettle. It must not be forgotten, however, that the additional quantity of heat procured by this means for the hot-air closet will increase the consumption of fuel in the kitchen fire; and also tend, by abstracting heat, to render the consumption of the fuel used there imperfect; but these are minor evils, compared with the saving of labour and the comfort which the judicious use of these cast-iron plates is calculated to afford. These plates, which are common in the north of France, have been introduced in the cottages on the estate of Closeburn, in Dumfriesshire, by its enlightened and benevolent proprietor, J. C. Stuart Menteath, Esq., who, having observed them in use on the Continent some years ago, immediately adopted them on his return home, with a degree of success altogether equal to his expectations and wishes.

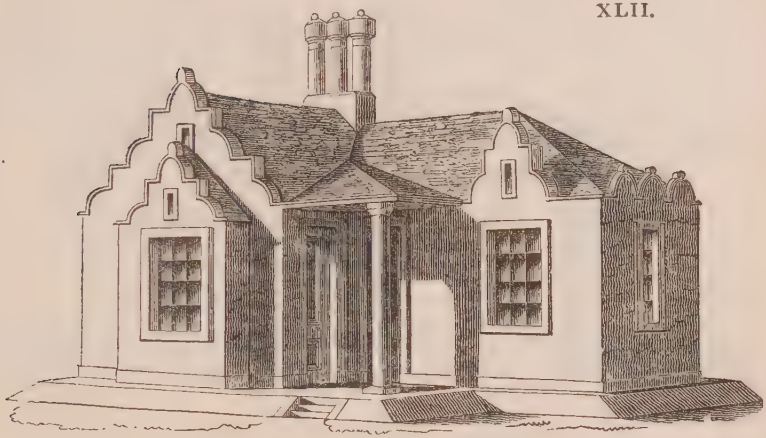


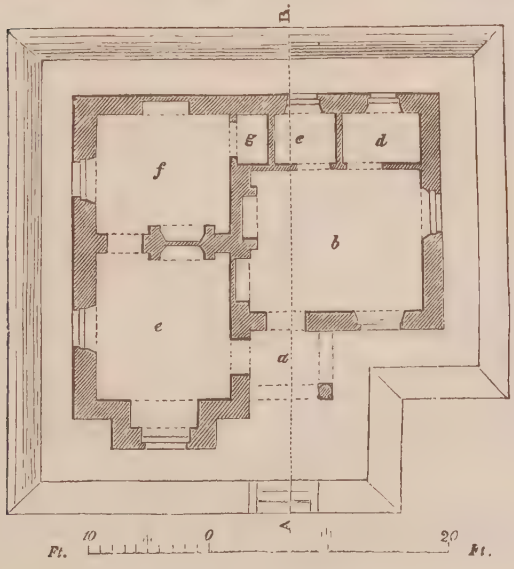


Design XLIII. — *A Cottage of Three Rooms, with Back Kitchen, Cow-House, and other Conveniences.*

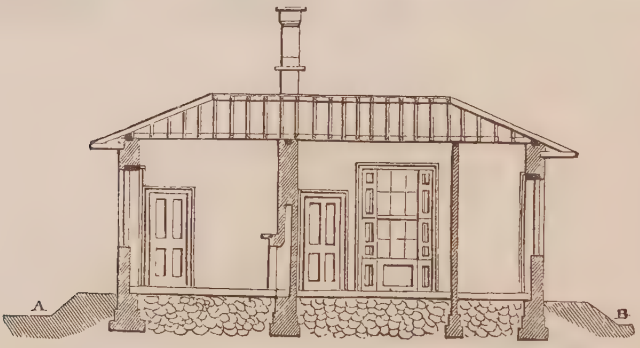
315. *Accommodation.* The plan exhibits an entrance porch, which serves also as a lobby, *a*; with one door opening to a kitchen, *b*; a back kitchen, *c*; and kitchen closet, *f*; another door opening to a bed-room, *e*, and bed-closet, *g*; and a third to a parlour, *d*. In a lean-to behind is an open shed, from which is an entrance to the dairy, *k*; and in the same lean-to there are a privy, *h*; pigsty or dust-hole, *i*; and cow-house, or root-cellar, *l*. There is a terrace shown round the building; but if the cow-house and pig-sty are used as such, then the terrace may be limited to three sides, and the fourth enclosed as a yard. This is a very commodious and convenient dwelling, and would no

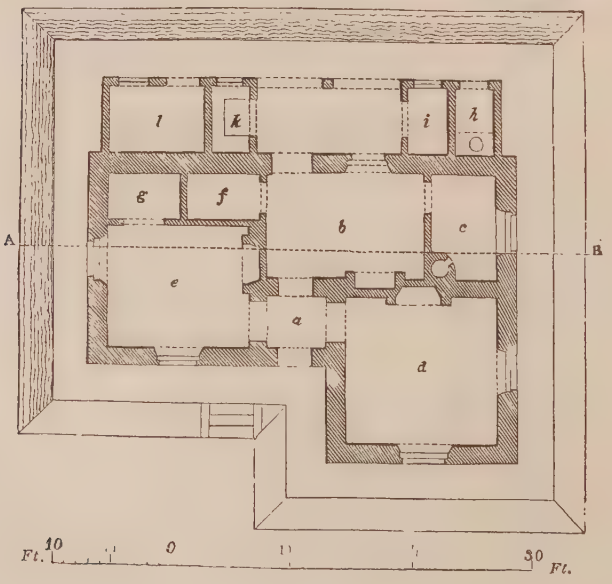
XLII.





XLIII.

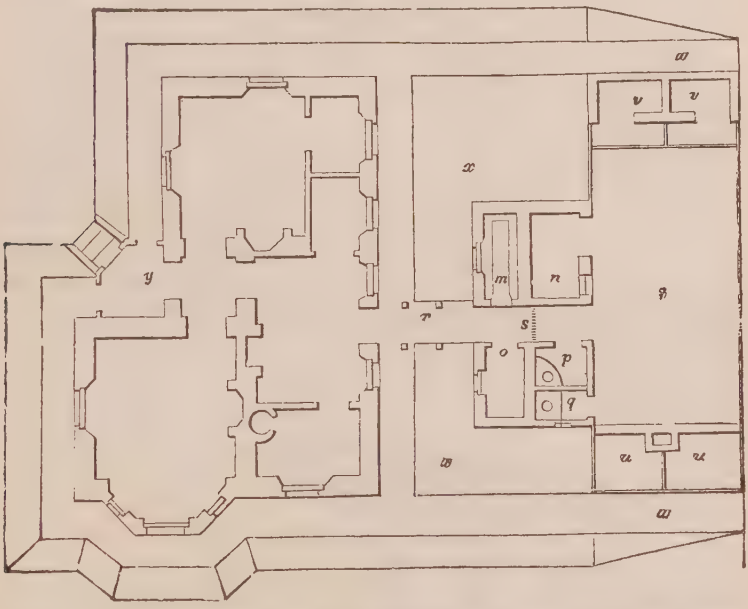




be expensive or difficult to execute, either in earth or of rubble-stone. The parlour, *d*, might be very readily heated from the fireplace of the kitchen, *b*, by means of a cast-iron plate, as described § 314. The open shed behind will be found useful for various purposes, as well as being a passage of communication to the dairy, and having a place for fuel and lumber at the opposite end.

316. *An elegant improvement* would be, to remove the pigsty and the cow-house farther from the dwelling, and connect them by a covered way open at both sides, as in fig. 297, in which *m* is the dairy; *n*, the cow-house; *o*, the pantry; *p*, the water-closet

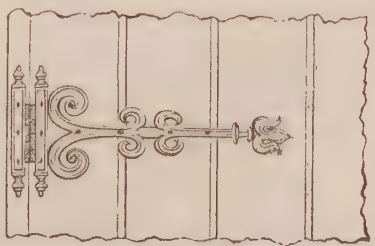
297



for females; *q*, that for males; and *r*, the passage which connects this wing with the house; *s*, a wicket gate, separating the yard from the passage, and from the platform on which the house stands; *t*, the yard; *u u*, tank for liquid manure and dung-pit; *v v*, pigsties; *w w*, inclined planes to the platform; and *x x*, grass-plots, which in some situations may be varied with flower-beds. It will be observed, at *y*, that we have altered the position of the steps to the terrace, and placed an open porch over the entrance. One advantage of this arrangement would be, that the terrace might be continued completely round the house; and, if it were thought desirable, as we undoubtedly think it would, the eaves might be made to project three feet, which would give a dry walk for infirm persons, or children, during rain.

317. *Construction.* The walls may be of earth; and, if it is found desirable, the whole of the floors may be heated from a flue from under the boiler, in the back kitchen, *c*; which, in this case, must have the space where the boiler is placed sunk three feet below the general level. The windows are shown with Gothic labels, and the door is ledged with ornamental hinges (fig. 298), on a scale of three fourths of an inch to a foot. The gable end is finished with a barge-board (fig. 299), to a scale of three eighths of an inch to a foot, but without a pendant or a pinnacle.

298



318. *General Estimate.* Cubic contents, 15,232 feet, at 6*d.* per foot, £380 : 16*s.*; at 4*d.*, £253 : 17*s.*; 4*d.*; and at 3*d.*, £190 : 18*s.*

319. *Expression.* Though we like the arrangement of this building in the interior, yet we by no means approve of the external expression. The projection of the roof at the eaves, which is here two feet, does not belong to the Gothic style; and to place labels over windows immediately under a far-projecting roof, is, in point of use, superfluous; since the original intention of labels was to throw off the rain from the windows, which is here already done by the eaves. The pitch of the roof is much too low for the Gothic or old English cottage, and is by no means suited for the ornamental barge-boards at the gable ends, which are never seen but against the ends of steep roofs. The windows ought to be of more lofty proportions, more especially as it appears by the section that they might be carried at least one foot higher; and, if they were lowered one foot, the window shelf would not be too low for use. The chimney tops rise out of the roof without any preparation, which is aways objectionable; and we do not think the position of the steps to the terrace particularly fortunate. If we were to alter

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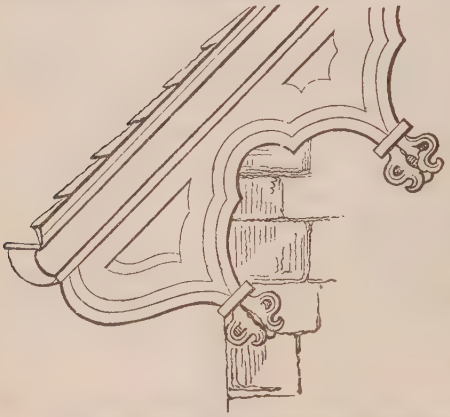


300

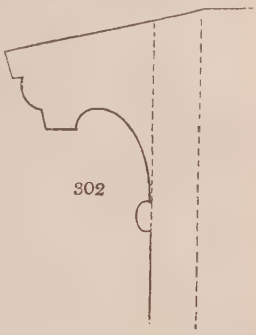
the ground plan, as in fig. 297, a very commodious and convenient cottage would be produced, and the elevation might then either be in the Italian, or modern style, as in fig. 300, or in the Gothic or old English manner, as in fig. 301.

301

Design XLIV. — *A Cottage of Three Rooms and a Back Kitchen on the Ground Floor, with various Conveniences.*

320. *Accommodation.* In the ground plan may be seen an entrance lobby, *a*; kitchen, *b*; bed-room, *c*; parlour, *d*; closets, *e* and *f*; back kitchen, *g*; dairy or pantry, *h*; pigsty or dusthole, *i*; privy, *k*; and cow-house or root-cellar, *l*.

321. *Construction.* The walls may be of brick or stone; the copings and finishings to the walls, windows, and chimney tops, to be of the latter material, or of Roman cement. The chimney head cornice may be finished, as in fig. 302, to a scale of one inch and a half to a foot. The designer of this cottage recommends the roof to be covered with painted pantiles; the windows to be divided into three parts by two mullions, and each compartment to have one iron frame filled in with latticework. The surrounding terrace appears by the section to be formed of earth, and the floors seem to be paved.


302

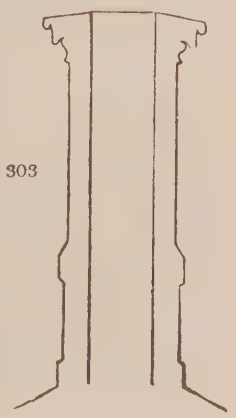
322. *General Estimate.* Cubic contents, 12,330 feet, at 6*d.* per foot, £308 : 5*s.*; at 4*d.*, £205 : 10*s.*; and at 3*d.*, £154 : 2*s.* : 6*d.*

323. *Remarks.* The accommodations of this cottage are obtained at more than ordinary expense, on account of the numerous projections in the ground plan, and the consequent angles, hips, and valleys, in the roof. The style is somewhat Elizabethan; but it is hardly justifiable to raise the two pediments over the entrance door and right-hand window; when, according to the section, there can be no use whatever made of the roof. It will also be observed by the section, that the doors, even of the dairy and back kitchen, are six-paneled, which is not very consistent with the entrance door, that being only ledged. While there is this attention paid to the style of the doors in the interior, no cornices to the rooms are shown, nor any shelf to the kitchen chimney. In short, not to waste criticism on a design scarcely worthy of it, though there is something of style in the elevation, and of accommodation in the plan, yet the composition, taken as a whole, is not such as to be held up as an example for imitation, but rather as a beacon to be avoided.

Design XLV.—*A Dwelling of Four Rooms, with Back Kitchen, and other Conveniences.*

324. *Accommodation.* From the entrance passage, *a*, a door opens to the kitchen, *b*, which is connected with the back kitchen, *c*, on the one hand, and with the bed-room, *d*, on the other. There is a parlour, *e*, and another bed-room, *f*, with a closet, *g*: and, in a lean-to, we have a cow-house or root-cellar, *h*; pigsty, *i*; and privy, *k*. Should the cow-house and pigsty be occupied as such, then it would be necessary to have a yard joined to that side of the house, and to alter the slope of the platform within it, as in similar cases. Some use may be made of the roof by a trapdoor in the ceiling of the kitchen, and the whole may be heated from a fireplace in the back kitchen.

325. *Construction.* The walls may be of brick or stone; and the panels, shown in the elevation, either executed in the brickwork or formed in cement. The roof is low in pitch, and it is proposed to cover it with slates. The chimney stack is large, containing four vents or flues; it has a sunk panel in the lower part, which, with the cornice at its termination, will be understood by the vertical section fig. 303, on a scale of half an inch to a foot. The section fig. 304, to a scale of half an inch to a foot, shows the projecting frieze, under the eaves of the roof, which is supported by the paneled pilasters. The door is paneled, and the windows are in the modern style, with sashes hung by lines, weights, and pulleys, &c.

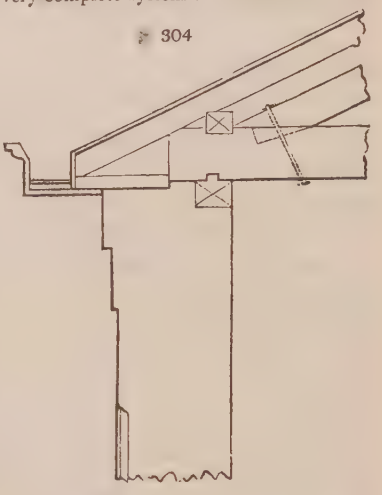

303

326. *General Estimate.* Cubic contents, 13,700 feet, at 6*d.* per foot, £342 : 10*s.*; at 4*d.* £228 : 6*s.* : 8*d.*; and at 5*d.*, £171 : 5*s.*

327. *Remarks.* There is a simplicity and grandeur in the elevation of this cottage, which raises it above the character of a dwelling of the humblest class. The massive chimney stack corresponds well with the simplicity of the roof; the effect of which is supported by the smaller, but similarly formed, roofs of the projections at the ends. The paneled pillars or pilasters, with the cornice over them, have

a massive and architectural effect, forming a very complete system of vertical and horizontal bond or chain work, as the French term it; and they are supported and harmonised by the horizontal panels in the chimney stack. Where the perfection of architectural expression is aimed at, all walls should be built either on the principle of vertical and horizontal bond, by projecting piers and horizontal bands; or, on that of squared stones or bricks, with or without piers and bands. The pretensions of a wall to strength would thus, at all times, be obvious at a single glance. By altering the destination of some of the parts of the ground-plan, this building might be rendered fit for the habitation of what is called a genteel family. Thus, *h* and *i* might be joined in one, and form a small bed-room or book-room, to the parlour, *e*; and *h*, in like manner, might be made a bed-room, or a dressing-room, connected with *d*. The appendages, *h*, *i*, *k*, might be got in a separate building, connected by a lattice-roofed arcade, covered with ivy, from the door of *c*.

304



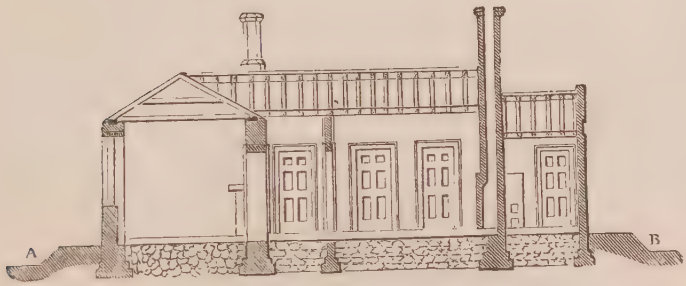
Design XLVI. — *A Cottage Dwelling, with Four Rooms, with a Back Kitchen, Cellar, and other Conveniences.*

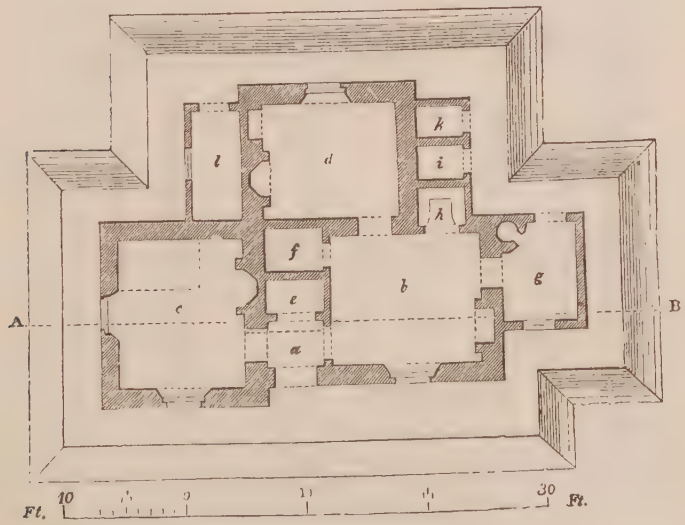
328. *The accommodations* of this dwelling are, as usual, a kitchen, *a*, with closet under the stair, *h*; back kitchen, *b*; parlour, *c*; bed-room *d*; cellar, *e*; dusthole, or place for fuel, *f*; and privy, *g*: there is a bed-room over the kitchen; and two useful garrets, one over *c*, *e*, *f*, and the other over *b*, *d*, *g*, which may be lighted from the ends. The apartment *e* may, in this, as in most of the other Designs, be used either as a cellar or a cow-house, or a place for keeping fuel and lumber; or as a receptacle for potatoes and other roots, or whatever may be most desirable in the given locality. We are of opinion that in most parts of Britain it will not be found profitable for the labourer to keep a single cow; but we are aware that in most parts of Scotland and Ireland, as well as in the north of France, the cottager never thinks himself comfortable without one. We are aware, also, that there are objections to having a cow-house and pigsty too close to a dwelling; but it will be recollected that much depends on the manner in which these animals are kept; and that, by disposing of the liquid part of the manure in the manner we have directed, and having the door of the cow-house so far apart from the door of the house as we have always shown it, the practical inconvenience would not be felt. We think the apartment for a cow ought to be added to all cottages not having a cellar, because, if not used for the former purpose, it may be applied to the latter; and a cellar is almost every where a great source of comfort to the cottager.

329. *Construction.* The paneled piers may be built of stone in courses, or of brick; or they may be framed of wood, and filled in with brick, and covered with cement. The same may be observed as to the architrave which rests on these piers or pilasters, and supports the roof. The interspaces between the pilasters may be formed of pisé, of brick or clay nogging, of rubble stone, of pebbles, of flint, or, in short, of any material which will support its own weight, and be of sufficient thickness to keep out the weather, and maintain a steady temperature; for the weight of the roof in this Design, and in Design XLV., is supposed to be carried by the piers. As a good deal of the beauty of this, and indeed of most designs for cottages showing pilasters, depends on the materials with which the panels or cementitious part of the wall is filled up, we shall here introduce a few remarks on the materials for walls, with a view of directing the reader's attention to the subject.

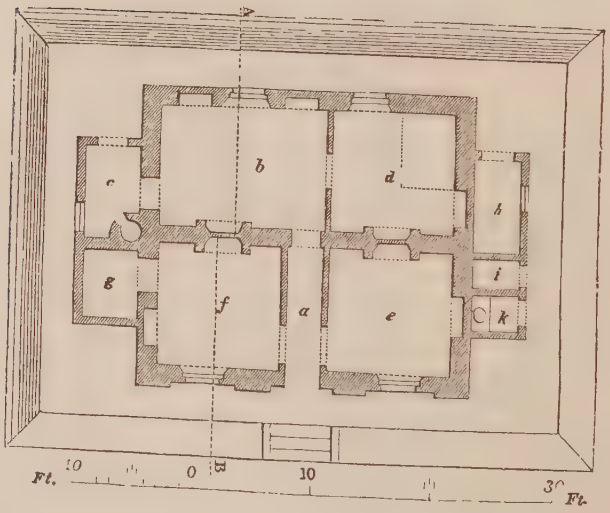
330. *Materials for Walls.* The design, the style, the accompaniments, and all other circumstances, being the same, the effect of the walls of a cottage being of squared stone, of rubble stone, of red, yellow, or white bricks, of flints, of pebbles, of mud, or of boards, will be very different; and more so to the ordinary spectator than to the artist, or to the eye accustomed to study the effect of forms, shades, lines, and colours, in some measure, independently of materials. The nature of the material, therefore, of which the walls of a cottage are built, is a fertile source of variety, where several cottages are to be built on the same estate; or where a village is to be formed, in which variety of character in the

XLIV.





XLV.



buildings is an object. As a general principle, it may be affirmed that the materials of the walls of a cottage ought always to be such as are, or may be, furnished by the soil or vicinity where it is placed. In this point of view, mud, pisé, brick, and timber are the most universal materials for cottage walls; and, next to these, small land stones, so far broken or squared as to incorporate in a wall built either on the bond or on the cementitious principle of construction. Among the land stones of a country are included the shale, scales, or shivery stone, of some districts, and the pebbles and flints of others. We shall here confine ourselves to giving short directions for forming a flint wall; and we shall take them from the *Landscape Architecture of Italy*, by Gilbert Laing Meason. Before we give this quotation, however, we wish particularly to impress on the minds of our readers the necessity of having coignes and other supports of the roof, which shall act on the principle of independent strength, in all cases where the walls are to be formed of pisé, mud, pebbles, flint, or, in short, of any material, the strength of which depends upon the cementitious principle; that is, on the plasticity, when used, of a part of the materials. This Design and the preceding one are examples of this mode of construction, and these remarks are introduced here incidentally; but in the systematic part of our work the subject will be treated in detail, and it will then appear to be one of very great importance, though very little understood.

331. *Flint Walls.* "In the chalk countries of England, why may we not renew the flint-built walls of our ancestors, seeing that the Roman circus at Toulouse has endured so long? Build up the flints in frames, and pour cement into the interstices; the foundation should be on brick arches; and the cement employed may be composed of thoroughly burnt chalk, slacked with water, to reduce it to the finest dry powder; and then sifted, and added to two parts of rough sharp sand, with small sharp gravel stones. The whole should be mixed together dry, and then a sufficient quantity of water should be poured upon it to make it into a liquid paste, which should be used immediately. The slacking of the lime, the mixture, and the application to the walling, should follow one another without delay. A quantity of the sand and powdered lime ought to be at hand to throw into the moulds, in case the mortar should appear too thin. By such management this cement requires not age to harden it. On examination of the oldest parts of the ancient castle at Hastings, we are satisfied that the mortar employed was so formed, and thrown, in a very liquid state, into the centre of the thickest parts of the wall. Flint-built walls would produce an excellent effect in irregular buildings; for the roughness of the surface, in towers, gives the impression of strength and stability."

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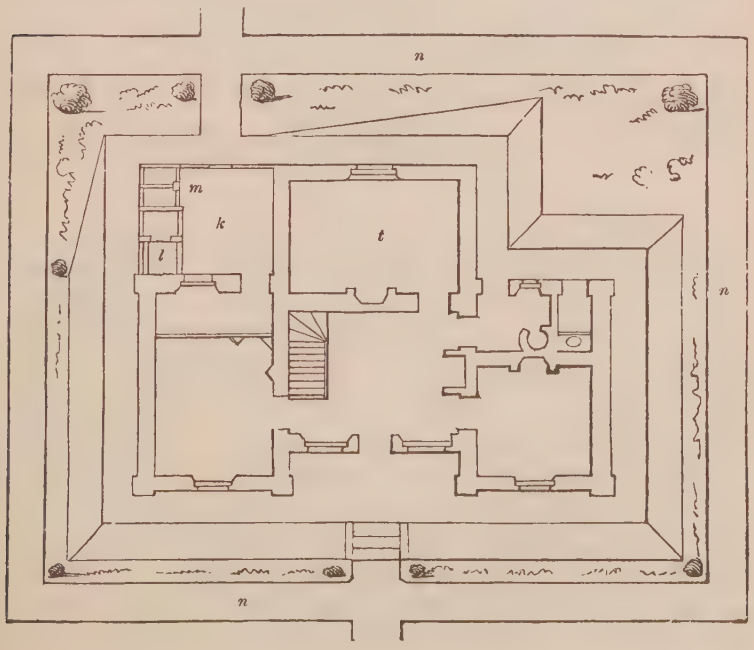

332. *General Estimate.* Cubic contents, 12,563 feet, at 6*d.* per foot, £314 : 1*s.* 6*d.*; at 4*d.*, £209 : 7*s.* : 8*d.*; and at 3*d.*, £157 : 0*s.* : 9*d.*

333. *Remarks.* The arrangement of the plan of this cottage is not favourable to economy in its execution, from the greater length than breadth of the body of the building, from the breaks and recesses in the walls, and from the raised part of the roof. All these deviations from the cube, which, it will be recollected, is the perfect form, increase the expense in proportion to the accommodation afforded. There can be no doubt, however, that this would be a comfortable building, because the heated air from the kitchen, *a*, would always keep the bed-room over it warm; and the fire both of the kitchen and the back kitchen might, by very little contrivance, render a fire at all times unnecessary in the room *d*, which might, according to circumstances, be made a shop or a parlour. Were it desirable to enlarge this dwelling, it might be done with great effect, by opening the door from *a*, as in fig. 305, in which *i* is the additional room; *k*, a small court-yard, containing the pigsty, *l*, and liquid manure tanks, *m*; the apartment *e*, in Design XLVI., being considered in this ground plan as a cow-house. We have shown a walk *n n*, surrounding this cottage, which leaves between it and the slope of the platform a border of an irregular width, *o o*, &c., which may either be covered with turf, or with shrubs, flowers, and two or three trees. Like Design XLV., this building, presenting a simple outline against the sky, is well adapted for a situation where it would be backed by a broken outline of wood. Having no windows in the ends, it is also better adapted for being viewed in front only, or chiefly, than for being seen on all sides.

Design XLVII. — *Two Cottages for Country Labourers, under One Roof, with Four Rooms in each, Back Kitchen, Pigsty, and other Conveniences.*

334. *Accommodation.* Each of these dwellings contains an entrance lobby, *a*; kitchen, *b*; back kitchen, *c*; parlour or best bed-room, *d*; staircase, *e*; dairy, *f*; place for fuel, *g*; cow-house, *h*; privy, *i*; and pigsty, *k*. The chamber floor of each house contains a bed room, *l*, with a landing, *m*, from the staircase, *n*; and another bed-room, *o*. We have not shown the yard which would be necessary to the cow-house and pigsty, as we think it more probable that these appendages will be applied to other purposes.

335. *Construction.* The walls may be of stone; but, as they exhibit few breaks or angles, they might be very advantageously built hollow, with bricks on edge, in Dearn's manner. In a country where fuel is abundant, we should recommend the floors of the kitchen and parlour to be of boards; but where fuel is scarce and dear, or chiefly wood, we should prefer having the floors paved, in order that they may be heated by a flue from the back kitchen. Or, a flue may be made above the floor, so as to form a bench, in the Chinese manner (*Mech. Mag.*, vol. iv. p. 362.); in several returns one over another, so as to form a stove, in the German manner; or in one of the partitions, as in the flued walls of gardens. Having recommended Dearn's mode of hollow walls as applicable to this building, we shall here proceed to describe it.

336. *Dearn's Method of building hollow Brick Walls.* The manner of bonding the work is shown in fig. 306, which is an elevation and section of part of a wall. "The three

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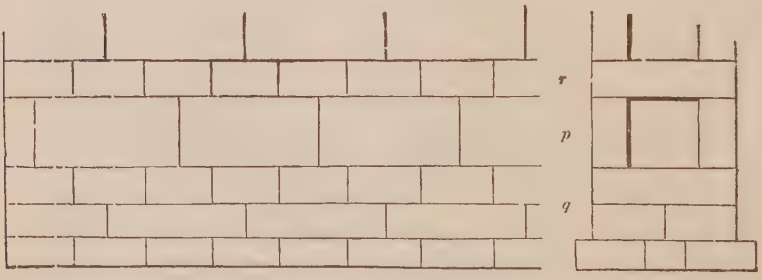
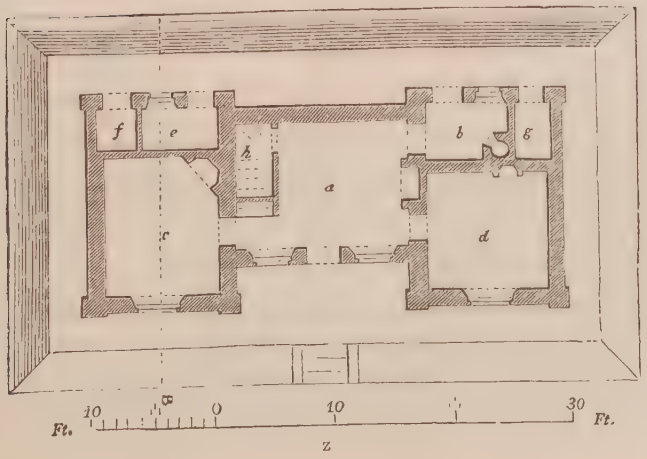


lower courses, *q*, the upper one of which is proposed to be level with the floor, are intended as a footing to the superstructure, and are laid in what is called the old English manner, consisting of alternate courses of headers and stretchers. The next course above is a stretching course on edge, *p*, and the backing course is like it, leaving an interval between of the width of half a brick; these are then covered with a heading course, *r*, laid flat; and the same system is pursued until the whole height required be

XLVI.



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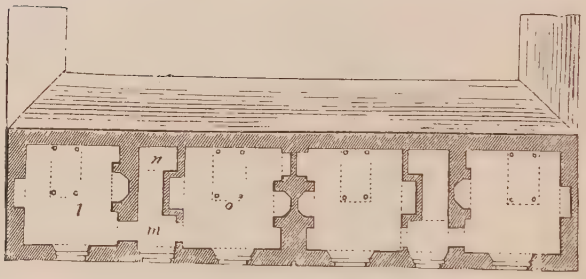
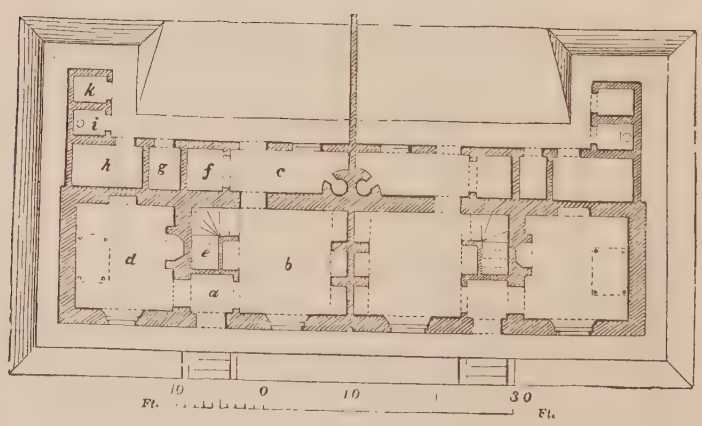
XLVII.





attained. Fig. 307 is a plan taken on the upper course of the footing, showing the manner of bonding the angles. The dotted lines denote the course above, of heading bricks laid flat. The two bricks on edge marked *s s*, at the angle, will be reversed in each other course. Fig. 308 displays the manner of introducing a girder, *t*, into walls thus constructed. To support the stress of the girder, the intervals in the walls below it, *u u*, are filled in solid with brickbats from the footing to the course on which the girder, *t*, rests, by which means a solid pier is formed, nine inches wide. In the course on which the girder lies, it is proposed to introduce a piece of timber, *v*, for it to rest on, nine inches long, four inches wide, and two inches and a half thick. Mortises for the joists are shown in the girder at *w w*. Fig. 309 shows the elevation of part of a building of this kind, in which a doorcase and a window frame are introduced: these are proposed to be of the same scantling as usual; viz., window-frames, two inches and a half by two inches and a half, and door-cases four inches by three inches; but in order to conceal the hollows in the wall, it will be necessary to tack in a fillet in the front or back of each window and door-case. In order to secure the frames in the wall, a piece of inch stuff, four inches square, may be attached to them at *x x*, by screws; the heads of the screws to be on the outer side, that the frames may be taken out at any time, if found necessary, without injury to the brickwork. To take the weight from the heads of these frames, a lintel, four inches square, may be placed within the brick on edge course, marked *y y*, extending nine inches beyond the opening on each side.

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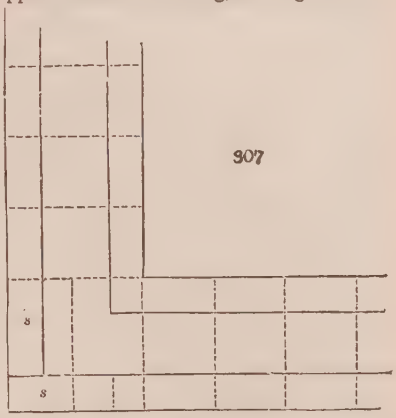

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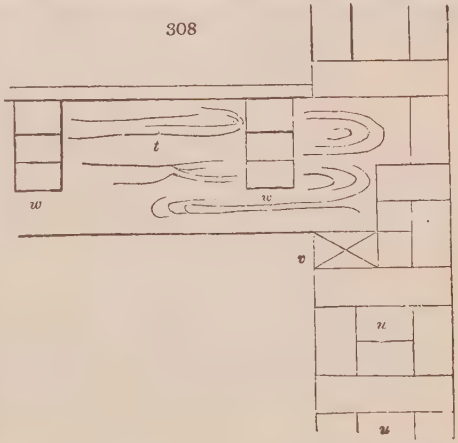

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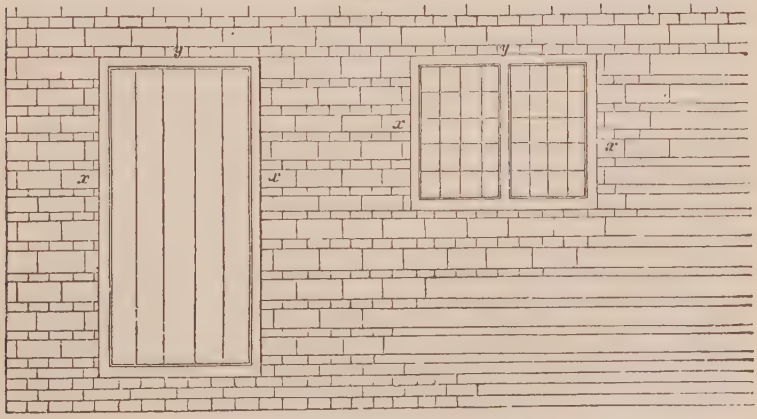
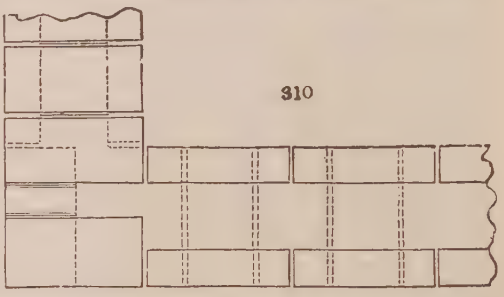


337. *Economy and other Advantages of Dearn's hollow Walls.* First, a saving of one third will arise in the article of bricks; that is, if 4500 would have been required to complete a rod of reduced work in the common way, 3000 will be found sufficient according to Mr. Dearn's method: secondly, only one half of the mortar will be requisite: thirdly, the labour will not be greater than for common brickwork, though it will include rubbing the bricks in the heading course to one length, in order to supersede the necessity of rendering (plastering) within, and to leave the walls with a fair face ready for white washing or painting in oil: fourthly, the hollows in the walls will prove an antidote to damp: and, fifthly, all the expense of inside plastering will be saved.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338. *Dearn's proposed Variation in his Method of building.* Instead of the brick on edge course, half bricks may be used as stretchers, figs. 310, 311, and 312; the bricks being divided longitudinally, by drawing a knife or other sharp instrument about half through them, while in a state between wet and dry, and giving each a slight stroke of the trowel on the reverse side, to separate the halves, after it has been burned. This is done, partly because, if the halves were entirely separated before being

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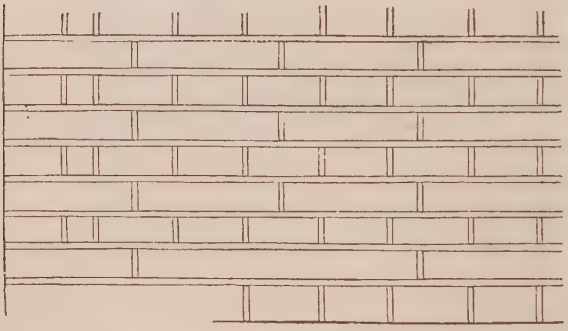

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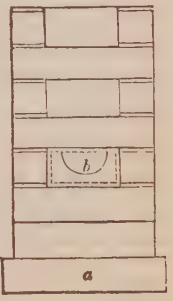
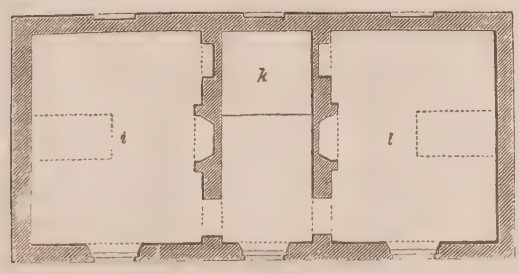
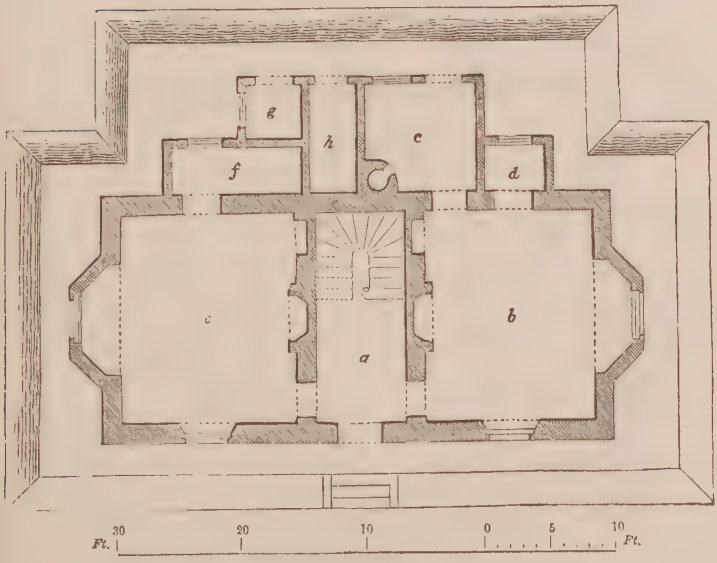


burned, the bricks would (in Britain) be subjected to a double duty; and partly because the half bricks, thus treated, cost less, and are less liable to warp in the kiln, than if moulded separately. A fair charge for removing bricks from the hack (the stock or pile on which they are placed to be burnt), with the cutting and replacing them, is *5s.* per thousand. With respect to bonding the work, it may either be carried up in the old English manner see § 336, and fig. 306); or in the Flemish manner: that is, having an alternate header and stretcher in each course; as the air may be made to circulate freely through the walls in both ways. The bond at the angles is shown in fig. 310; and fig. 311 shows the appearance of the work in elevation. Fig. 312 is a section in which at *a* is shown the footing, and three courses above it, carried up solid, with a drain brick, *b*, set in cement on a level with the supposed floor of the house. The use of this course of draining bricks is to carry off any water that might at any time find its way into the vacuity, when this mode of building is used in walls under the level of the ground.

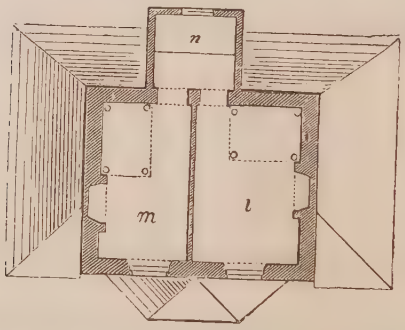
339. *Dearn's Mode of building Fourteen-Inch hollow Walls.* When the thickness of the walls is proposed to be fourteen inches, the stretching course may be of whole bricks, instead of half ones, and the heading course may be bricks fourteen inches long, which are frequently made for the purpose of coping dwarf walls; but, should economy be the main object, Mr. Dearn proposes to use half bricks for the stretchers, which, he says, will produce a wall strong enough for all ordinary purposes; and which will only require some degree of management when used for underground walls, when it will be necessary to take care that the lateral pressure of the soil outside does not throw the wall off the

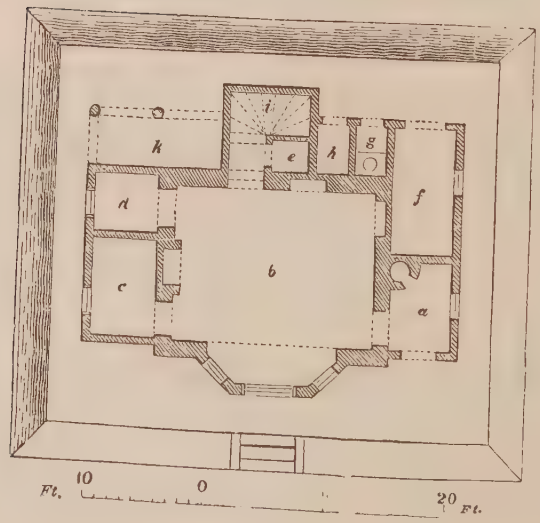
XLVIII.





XLIX.





perpendicular. Where there is any danger of this (which can only be when the foundations are made in very soft ground, or where the outside walls of a house are to be earthed up, in order to form a terrace, he directs the builder to extend the excavation, in those parts where the evil is anticipated, to a distance of not less than three feet six inches beyond the proposed face of the wall; and, as the brickwork is carried up, to fill in the earth not more than one foot thick at each time; to ram it well, and at each interval to introduce a thin layer of *green* faggot-wood, with the butt-ends to the wall: the ground thus made will unquestionably be found to settle; but there can be little or no stress on the wall, the lateral pressure being directed by the faggot-wood to the natural earth opposite."—*Hints on an improved Method of Building*, &c., p. 36.)

340. *Dearn's hollow Walls, applied to the heating of Green-houses, as hot Walls for ripening Fruit, and for warming Barracks, Workhouses*, &c. Mr. Dearn thinks that conservatories, vineries, &c., attached to houses thus constructed, may be heated without much expense, if placed against or near the back of the kitchen fireplaces. For this purpose he proposes to form the back of the range of a plate of cast iron, not less than one inch thick, open on the reverse to the hollow in the wall. From this plate such a degree of heat would be diffused throughout the whole extent of the wall, as would probably be sufficient to preserve the tenderest plants in the most inclement seasons, and to forward vines as much as a common forcing-house. The heat might be regulated by an opening in the wall externally, either above the conservatory, &c., or on the side, as the case should require. Barracks, workhouses (commonly so called), houses of industry, and manufactories, built according to Dearn's method, may also, he conceives, be warmed, without any additional expense, and the heat so regulated as to answer the various purposes required. (*Ibid.* p. 37.) In our *Treatise on Country Residences*, 4to, 1816, we gave a plan of a house, with a large conservatory and vinery attached to it, both heated from the fires of the living-apartments, the kitchen, and the offices; and showed by the section, fig. 313, a very efficient mode of abstracting heat from cast-iron plates at the back of the different fireplaces. We have since put the plan in practice (in 1817); and it is but candid to state that we cannot recommend it either in point of comfort or economy. In point of comfort, it is objectionable, on account of the great quantity of heat which is drawn off, and the consequent necessity of attending constantly to the fire; and in regard to economy, the same abstraction of heat renders the consumption of the fuel, especially coal, very imperfect; and, consequently, more is required to produce any given temperature, than would be case were the back and sides of the fireplace either of firebrick only, or of iron plates with solid masonry behind them.

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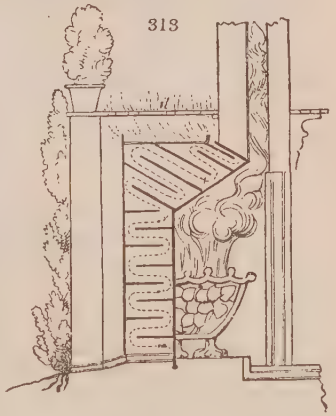

341. *General Estimate.* Cubic contents, 27,760 feet, at 6*d.* per foot, £694; at 4*d.*, £462: 13*s.*: 4*d.*; at 3*d.*, £347.

342. *Remarks.* This Design is well calculated for being executed at a very moderate expence. The span of the roof not being more than 14 feet, timber of very slight scantling may be used both in the floors and in the roofing; and the walls, as we have seen, need not be wider than nine inches, and may be built hollow, either in the manner detailed, Chap. I. § 25; or according to some one of the modes just described. If it were desired to ornament such cottages, it might be readily done by placing chimney pots on the stacks, by porches, or by a veranda; in either case, adding a parapet to the terrace. The ends of both cottages, being without windows, may be covered by vines or fruit trees; and a few China roses may be planted along the front.

Design XLVIII. — *A Dwelling of Four Rooms, with a Back Kitchen, and other Conveniences.*

343. *Accommodation.* The ground-floor consists of a lobby and staircase, *a*; kitchen, *b*; back kitchen, *c*; dairy, *d*; parlour, *e*; bed-room, *f*; water-closet, *g*; and cellar, *h*. The chamber floor contains two good bed-rooms, *i* and *l*, with the staircase, *k*, between them.

344. *Construction.* Dwellings in this style are common in various parts of Gloucestershire, and other parts of England, where freestone is abundant, and easily worked

They are generally covered with a grey slate, and the walls are in regular courses of tooled stone. As the inner part of these walls is generally built of rubble, they cannot be considered strong; unless, indeed, a mortar were used capable of becoming as hard as the stone itself, or at least as Roman cement. To add to the strength of such walls, what are called string courses are introduced in them; one of which may be observed in the elevation of this Design, as a horizontal band between the ground floor and bed-room windows. This band, horizontal chain, or string course, is supposed to be formed of stones of a sufficient width to cover the whole wall, and by that means to tie it together; and this, if the rubble part of the wall has been properly built, it will effectually do. If, on the other hand, the rubble stones have been small, and have not had true bearings, (that is, flat surfaces resting horizontally on each other), these string courses will add very little to the strength of the wall. When the reader comes to that part of our work which treats upon the principles of construction, he will find, what will probably surprise him, that the strongest, as well as the most durable, of all walls for dwelling-houses, are those of well burnt brick, covered with Roman cement without and plaster within. Even without these coverings, brick walls are stronger and more durable than stone walls, as the latter are generally built. There can be no doubt that stone walls might be, and sometimes are, so constructed for dwelling-houses, as to be stronger than common brick; but the expense, except under very peculiar circumstances, is too great for general use.

345. *General Estimate.* Cubic contents, 24,548 feet, at 6*d.* per foot, £613 : 14*s.*; at 4*d.*, £409 : 2*s.* : 8*d.*; and at 3*d.*, £306 : 17*s.*

346. *Remarks.* The rooms in this Design are of a convenient size, and the dwelling may be considered as suitable for a gardener or other upper servant. For effect, we should have preferred three lights in each of the bays of the kitchen and parlour, and no windows on the other side of these rooms. We say, that, for effect, we should have done this; but, for convenience and use, it is better that the light should enter on two sides, because two parties may then work at two different windows. Respecting the situation of this building, its contributor observes that it "should be placed on rather an elevated spot, thickly covered with wood. When the outline of a building is so constructed that the various projections throw a mass of shade upon the receding parts, then the object itself forms an independent picture; but in buildings of a plain unbroken outline, such as this cottage, some assistance is wanted to produce the picturesque; and trees will be found efficient auxiliaries in accomplishing this effect."

Design XLIX. — *A Dwelling suitable for a Lodge or Toll-house, having Three Rooms, and other Conveniences.*

347. *Accommodation.* The ground floor consists of an outer kitchen, which serves also as an entrance-lobby, *a*; large kitchen, or living-room, *b*; light bed-closet heated from the back of the kitchen fire, *c*; pantry, *d*; closet for fuel, *e*; cellar for roots, *f*; privy, *g*; dusthole, *h*; stair to the bed-room floor, *i*; and open shed, *k*. The chamber story contains two bed-rooms, *l m*, and the landing of the staircase, *n*.

348. *Construction.* The walls be may of brick, and the roof covered with tiles or slate. The cornice of the principal part of the building may contain a gutter cut in the stone, similar to that shown in the section fig. 40, § 74, if that material should be abundant; otherwise, the cornice and gutter may be of wood, as shown in the section fig. 63, § 84.

349. *General Estimate.* Cubic contents, 11,315 feet, at 6*d.* per foot, £282 : 17*s.*; at 4*d.*, £188 : 11*s.* : 10*d.*; and at 3*d.*, £141 : 8*s.* : 9*d.*

350. *Remarks.* The expression of this dwelling seems to aim at something more than a simple humble cottage, because it may be said to have a centre and two wings, like a cottage villa, or like what in Scotland is called a minister's house; yet there is no attempt at architectural style, either in the general forms or the ornaments. We leave our readers to contrive different modes of altering or adding to it, so as to make it more attractive without, and more convenient within.

Design L. — *A Cottage Dwelling of Four Rooms, with other Conveniences.*

351. *Accommodation.* On the ground-floor there is an entrance and staircase, *a*; parlour, *b*; bed-room, *c*; closet under the stairs, *d*; pantry, *e*; light bed-closet, *f*; and kitchen, *g*. The wash-house, privy, and other conveniences, are supposed to be in a separate building. The chamber floor contains a bed-room, *h*, and two closets, *i* and *k*.

352. *Construction.* All cottages having no cellar floor may have the walls built of rammed earth, on a brick or stone foundation; though we would never recommend earth where brick or stone can be afforded. The roof is shown with a considerable projection at the eaves, and it is covered with Grecian tiles.

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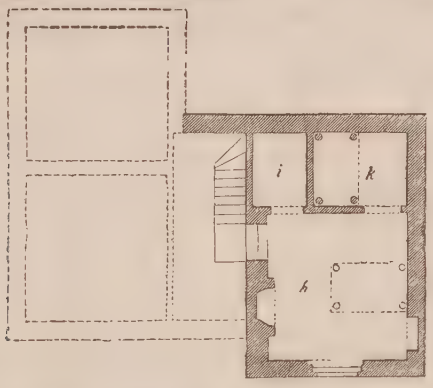

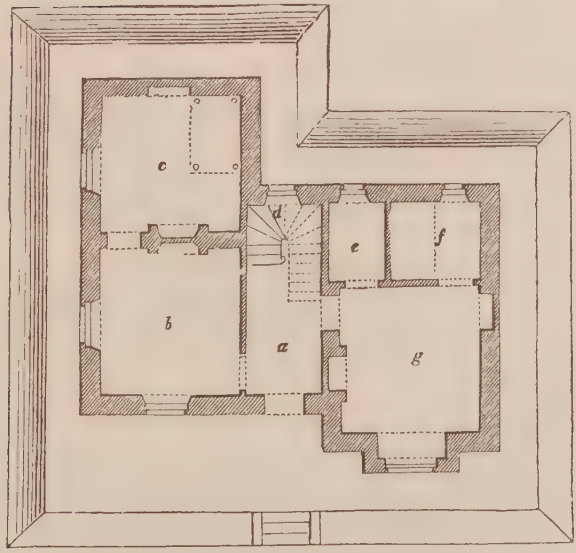

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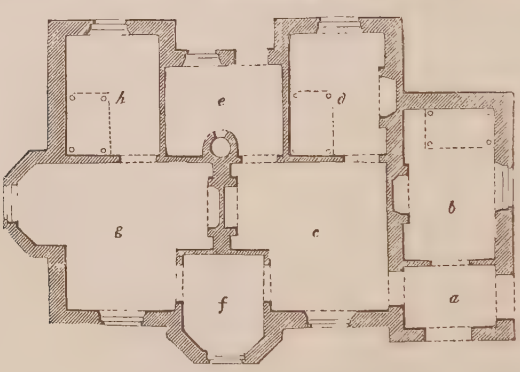
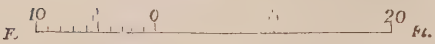
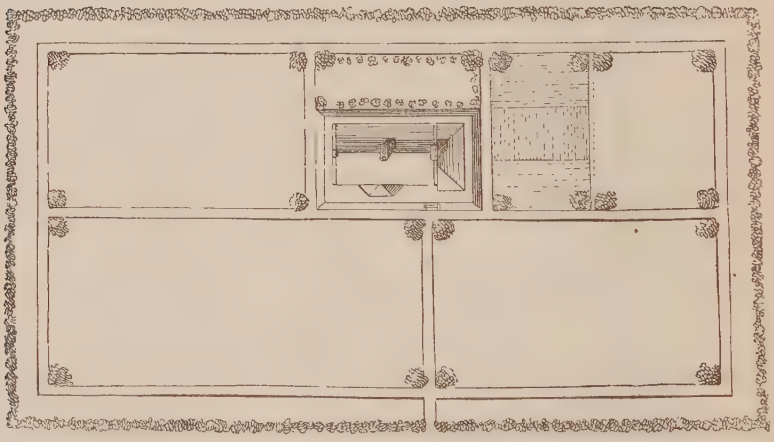
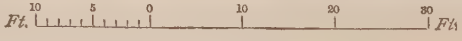




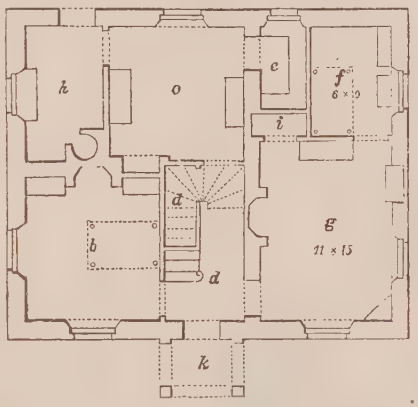




353. *General Estimate.* Cubic contents, 15,704 feet, at 6*d.* per foot, £392 : 12*s.*; at 4*d.*, £261 : 14*s.* : 8*d.*; and at 3*d.*, £196 : 6*s.*

354. *Remarks.* The expression of this dwelling is agreeable, and the tiles give it somewhat the air of an Italian cottage. The windows, however, are modern, and the chimney tops are such as are used in various manners. As picturesque effect appears to have been studied in forming the Design of this cottage, we rather wonder that no porch was placed over the door, which would have added much to its beauty. It is true, the far-projecting roof will, in some measure, compensate for the want of this part of an edifice; but we do not think it ought ever to supersede it. It is curious to observe, in the ground plan of this Design, the preference which the designer gives to irregular beauty over that which is regular. Had his object been to produce a regular symmetrical building, he might have done so out of the same extent of walling, by adopting the ground plan fig. 314. By this arrangement, *f* and *g* are greatly enlarged; and a commodious back kitchen, *h*, linen closet, *i*, and a porch, *k*, are added. The apartment, *c*, will then become the kitchen (instead of *g*), and the pantry, *e*, and the back kitchen, *h*, will open into it. The space over *e*, *f*, *g*, and *i*, when equally divided, will afford two good bed-rooms in the chamber floor. The superficial surface of the ground occupied by this improved plan (fig. 314) is 1292 feet, while that of the original ground plan is only 875 feet. This difference will, of course, occasion an additional surface of roofing; but, as it is the angles and breaks of a roof which are the most expensive parts, the cost will be very nearly the same; the improved plan approximating much nearer to the form of a cube, and requiring only a plain roof. The lineal length of external walling, or the girth of the building, is 135 feet in both plans, and the internal walling is but little increased in the improved one. Thus, the second plan, though containing so much more accommodation, would cost very little more than the first; for though the cubic contents of the building, according to the improved plan, will be 17,664 feet, while those of the original Design were only 15,704 feet; it must always be remembered, by those who wish to make an estimate of the expense of, or to fix a value upon, buildings measured in this manner, that the contents of the original Design would require to be calculated at 5*d.* or 5½*d.* per foot, while those of the Design fig. 314 from its nearer approximation to a cube, and the simplicity of its roof, need not be estimated at more than 4*d.* or 4½*d.* per foot. The elevation of a building constructed according to the improved plan, would not be so picturesque as that of the original Design, but we do not think that it would be less beautiful. And why would it be less picturesque? Because it would have less irregularity of form, of outline, and of light and shade; and, consequently, of that kind of beauty which is more particularly adapted for transferring to paper, or to canvass: it would, therefore, not form so marked a character for the painter; in the same way as a plain honest man would not afford so good a study for a novelist, or so interesting a subject for a biographer, as a man of irregular features, both of mind and character. Let it be observed, however, that we do not object to the irregular style of beauty, for those who can afford it: all that we mean to say is, that it is neither so economical to erect, nor so easy to keep in repair, as the symmetrical style; and that, as we have frequently before stated, symmetry is the soul of Architecture.

314



Design LI. — *A Cottage Dwelling, with Six Rooms and other Conveniences.*

355. *Accommodation.* There is a good entrance porch, *a*, with two doors, the one to be kept shut when the other is open, to protect the interior from the weather most likely to penetrate into it. From this porch there is a door to a room, *b*, which might be used as a workshop for a tailor or shoemaker, or other similar trades, in the country; as an infant school on a small scale; as a shop; or let off as a bed-room. There is a kitchen, *c*, communicating with the bed-room, *d*; a back-kitchen, *e*; and an ante-room, *f*. This ante-room may be used as a small green-house, or as a china closet, if the cottage were occupied by what is called a genteel family; or if it were used as a public house, it would make an excellent bar; or, for a private family in humble life, it might be a

child's bed-room, or a pantry. The parlour, *g*, communicates with the bed-room, *h*. The privy and other conveniences are supposed to be contained in a separate building on the outside of the garden.

356. *Construction.* The walls are shown of a proper thickness, for being built of earth, or of rubble stone, or of any description of cementitious wall without chainwork; that is, without what in carpentry are called ties and strutts. The roof may be covered with slate, and finished, as in fig. 63. § 54.

357. *General Estimate.* Cubic contents, 16,848 feet, at 6*d.* per foot, £421 : 4*s.*; at 4*d.*, £280 : 16*s.*; and at 3*d.*, £210 : 12*s.*

358. *Remarks.* This is an example of an irregular, and yet not picturesque building, and of a good deal of accommodation without convenient arrangement. The plan is irregular, from the projection of the two bays of the apartments *f* and *g*; and from the projection of *d* and *h* beyond the line of frontage of *e*; but the regular pentagonal sides of the bays, and their tame roofs, present nothing strikingly irregular in the elevation. There is nothing irregular or picturesque in the roof, nor in the porch, which occupies too large and important a portion of the main building for its use. Bay windows are great additions to the cheerfulness of rooms when they have lights on three sides, and this they always used to have in Britain, till the great increase of window-duty, during the war with Bonaparte, rendered bay windows with three lights too expensive for the middle classes, not to speak of the lower. Bays, with only one light, as in the Design before us, are neither handsome without, nor cheerful within; and, in a cottage, the gain in point of room is by no means commensurate with the expense. In point of expression, bay windows of three lights convey ideas of ancient times; because the forms of the windows, in that case, are different from what they are when only one window is placed in the centre of each bay. In the Design before us, the modern window in the bay seems misplaced and incomplete. However, we have here the materials for a good comfortable dwelling. Let us suppose the central bay, *f*, made a central porch; the bay of *g* placed in the centre of that side of the room; the porch, *a*, turned into a pantry; and the bed-room, *b*, made to open from the kitchen. We shall then have the leading features of a good plan, fig. 315: and by adding a place for fuel, *i*; a privy, *k*; and carrying out the front wall of *e*, we shall have a dwelling fit for any person to reside in, all other circumstances, such as situation, aspect, dryness of floors, &c., being favourable. The elevation, at very little expense, might be rendered handsome, fig. 316. No particular

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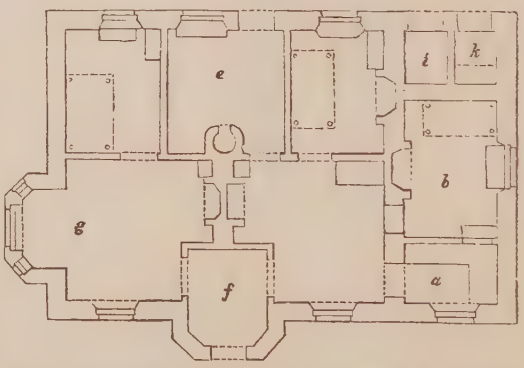

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description is given of the garden, as it may be laid out and cultivated in the same manner as any of the gardens already described; as, for example, that of Design XIX. § 170.

Design LII. — *Ideas for altering the Front of an old Cottage, at present in a dilapidated State.*

359. *Present State*, fig. 317. The contributor of this Design observes that fig. 317 is an unsightly cottage, standing at the extremity of a village, and close to the gates of a venerable mansion built in the reign of James I., and much admired both for its antiquity, and the elegant comfort of its interior. He says: — "As I have the pleasure of being occasionally useful to my friend in some of his plans for improvements, he consulted me as to the way in which he might give the cottage a more agreeable appearance; and I suggested the alteration shown in fig. 318, which may serve as an example in what manner a cottage, with the inside sufficiently comfortable, may be altered, so as to change an ugly outside, at little trouble and expense, to one that is picturesque and pleasing. The house is convenient enough within, and has some very comfortable rooms; but as there is nothing in all this very remarkable, I will not trouble you with the ground plan."

317

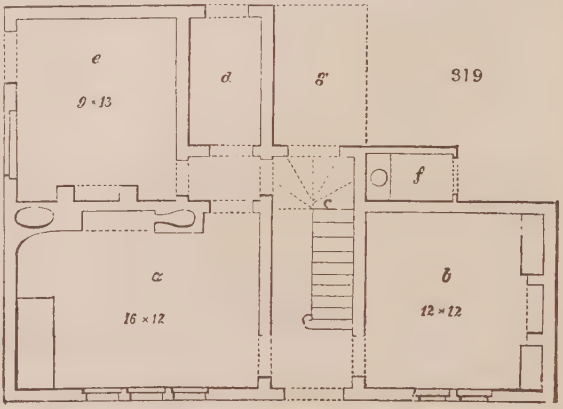
318

360. *Improved State*, fig. 318. "The object in the above alteration is, to break the straight horizontal lines, and thus improve the appearance of a very ugly roof. This is done by introducing a pediment, or gable, with barge boards over the centre window, and by bringing the roof lower down at the eaves, so that the upper windows may be let into it. The carcass of the house being a wooden frame filled in with clay nogging and plaster, the wall of the additional gable is constructed in a similar manner. By way of giving consequence to this dwelling, the style of the entrance door is improved, and a common window changed into a bay one."

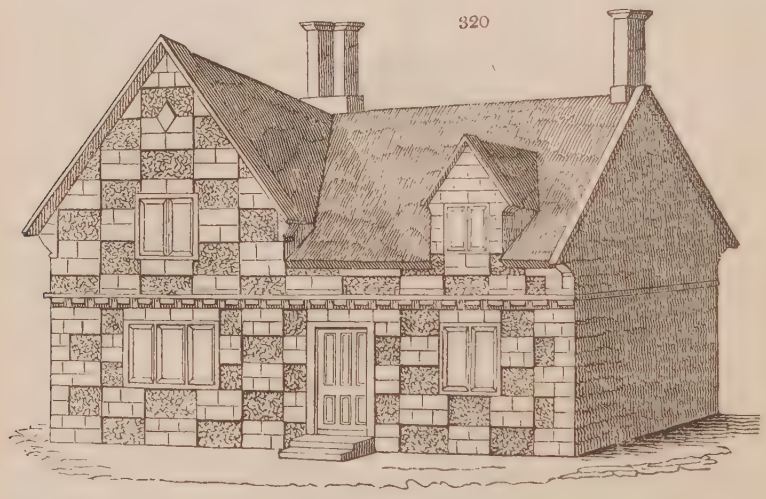
361. *Remarks.* The alterations are, no doubt, improvements; but there does not appear a sufficient reason, on the principle of utility or accommodation, for the introduction of the pediment or gable. If the window under it had been carried up half way into it, this sufficient reason would have been given at once; and no one, we think, can deny, that even the appearance would have been improved. Architecture is a reasoning art; that is, it is an art in which nothing should be introduced for which there is not a reason either real or apparent. A real reason is best; but, when we have not that, we should at least have its substitute. There is no reason in fig. 318, for the pediment, except that given by the author of the Design, which we hold in this case to be insufficient.

Design LIII. — *A Cottage for a Village Tradesman.*

362. *Accommodation.* This Design was made for a shoemaker, who wanted only three rooms on a floor. It was intended to be a corner house; and to contain, on the ground floor, fig. 319, a kitchen, with oven and boiler, *a*; parlour, *b*; cellar, under the stairs, *c*; pantry, *d*; shop, *e*; and privy, *f*. If it were desirable, a lean-to back kitchen or washhouse might be built in the situation of *g*. The chamber floor contains three rooms. Fig. 320 is the elevation.



363. *Construction.* The walls are supposed to be built of "brick and flints, in alternate squares. This mode of building with a mixture of stone, brick, or even chalk, with flints, is common in several counties in England, and has a very picturesque effect, either with the different kinds of materials in alternate layers, or in squares, as in this Design. When chalkstone forms one of the materials used, the roof should always project a good way over



the walls, to protect them from the rain; in which case, even if the chalk should be so soft as to yield to the impression of the nail, it will last very many years. The roof is thatched; the gables have stone tablings (barge stones), and the summer stones are cut in the form shown by *h*, in fig. 321. Sometimes the tabling, *i*, is formed of brick, but the summer stones are always required to be of stone. Figs. 322 and 323 are sections of stone window mullions, such as are common in the neighbourhood of Salisbury, and which are there considered very ornamental. Where stone is too expensive, these mullions may be made of wood. Fig. 324 is a plan of the chimney tops."

364. *General Estimate.* Cubic contents, 12,336 feet, at 6*d.* per foot, £303 : 8*s.*; at 4*d.*, £205 : 12*s.*; and at 3*d.*, £157 : 14*s.*

365. *Remarks.* The shoemaker, we are informed, "preferred being his own Archi-

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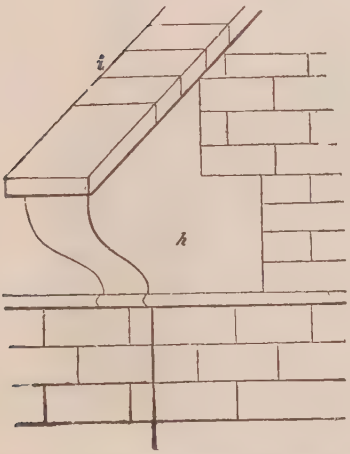

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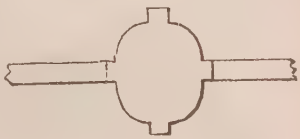

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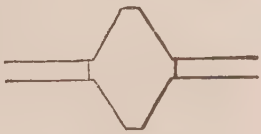

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tect; and erected a cottage of three rooms on a floor, fig. 325; and these all in a row His kitchen and common sitting-room, *k*, is thus rendered a perfect temple of the winds. There are a door and window to the north, and the same to the south; besides three other doors, making of doors and windows no less than seven in a room only fourteen feet square. He also contrived to have the stairs come down by the parlour fire-place, *l*; and two of the bed-rooms above necessarily became passage rooms to the third. I mention this, to show how little notion people of this class have of comfort in houses."

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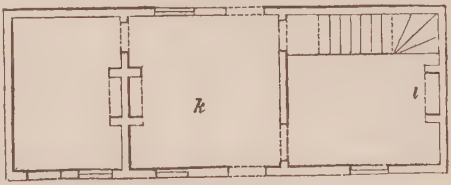

366. *Criticism.* When different kinds of materials are introduced into the walls of a cottage, some principle of fitness, independent altogether of picturesque beauty, ought to regulate the manner in which they are disposed. Where the specific gravity, hardness, and tenacity of the materials are equal, they may yet differ in their size, and in their form, or in the applicability of their surfaces. In this case, vertical bond in the form of piers, and horizontal bond, in the form of lintels or string courses, ought to be constructed of the large and flat-surfaced materials; while those of smaller size and less regular shapes should be used to fill up the blank compartments so formed. In the walls of a house composed of flints and chalks, greater strength will be produced by chalk over chalk, and flint over flint, than either by the mixture of these, or by their position in alternate layers, or squares. The picturesque beauty of such an arrangement will, we think, be at least equal to that of fig. 320; while it will have that most satisfactory beauty in addition, the beauty of fitness. In fig. 326 we have supposed the walls built of the same materials as those of fig. 320; but we have disposed them agreeably to what we consider the principles of architectural fitness, or, in other words, of sound architectural construction. There was no occasion for having the window of the bed-room over the parlour in the roof, when it might have been in the gable end; and that the fireplace is rather unfortunate in being placed in an outside wall. We should have placed it against the stair, for the sake of the heat to the staircase, and the rooms above; though we acknowledge that, in point of appearance in the interior of the sitting-room, it has a better effect where it has been put by our contributor. We believe that the greater number of our readers will prefer the fireplace where it is for another reason, and that is, having the chimney shaft as a termination to the gable end. This is good and reasonable, when we look no farther than commonplace ideas of external effect; but when we look at it with the eye of improved reason, and reflect that all fireplaces and flues in outside walls waste great part of their heat in the external atmosphere, and besides often do not draw well, we discover a reason why it would have been more beautiful, rising from some other part of the building, which might indicate that the flue was in an internal wall. Thus it is that taste, to be correct, requires to be founded on reason.

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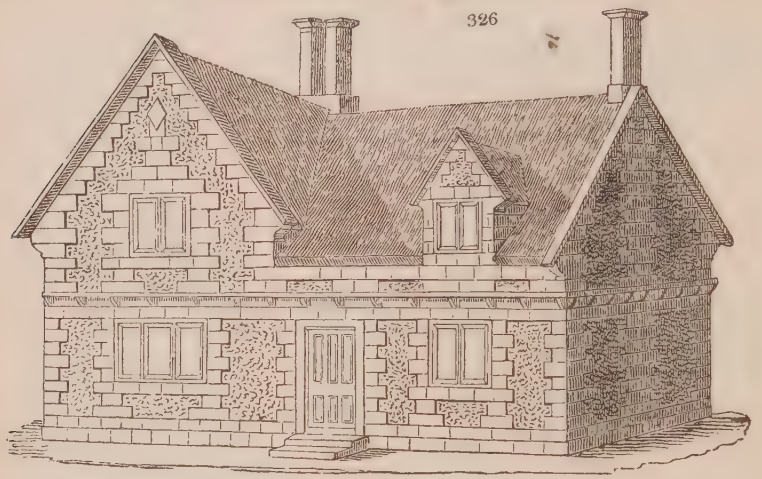

Design LIV. — *Two Cottage Dwellings for Labourers, under One Roof.*

367. *Accommodation.* The larger dwelling, fit for a man with a large family, will contain three rooms on a floor, with a cellar under the stairs, and a wood-house behind; besides a cow-house, pigsty, &c., in a small farm-yard. The smaller dwelling is intended for an old couple, and contains only two rooms. The details of the larger dwelling are as follow: — *a*, the porch; *b*, the kitchen; *c*, the back kitchen; *d*, the steps down to the cellar under the stairs; *e*, the dairy and pantry; *f*, the wood-house; *g*, the pump; *h*, the hay-stack; *i*, the wood-stack; *k*, the privy; *l*, the cow-house; *m m*, two pigsties; and *n*, the dung-pit. In the chamber floor there are three bed-rooms, over *b*, *c*, and *e*. The smaller dwelling contains a kitchen, *o*, with an oven on one side of the fireplace, a closet on the other, and a pantry under the stairs; a back kitchen, serving as a wash-house, *p*; a wood-house, *q*; a wood-stack in the yard, *r*; privy, *s*; pigsty, *t*; and dung-pit, *u*. There is one bed-room, and an apartment over *p* and *q*, in the chamber floor.

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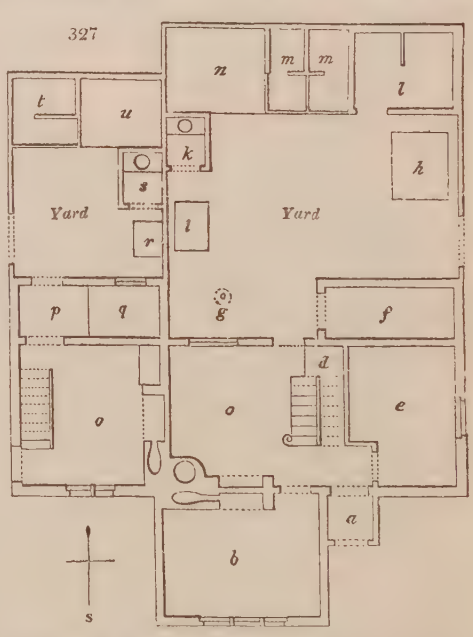

368. *Construction.* The walls of the ground floor are shown in the elevation, fig. 328, as built of stone, and the upper part of the building of framed work; the panels to be filled in with lath and mud plaster, or with wattled work; and, in whatever way done, plastered with lime mortar outside. The roof is of thatch, and the chimneys of stone.

369. *General Estimate.* Cubic contents, 15,360 feet, at 6*d.* per foot, £384.; at 4*d.*, £256.: and at 3*d.*, £192.

370. *Remarks.* The contributor of this Design offers the following observations upon it: — "Double cottages have several advantages, especially in a scattered village. Two cottages are built cheaper, if united, than if separate; and the effect is often more

picturesque. Besides, it adds to the comfort of the poor, to have a neighbour close at hand, in case of sickness; and, in other respects, near neighbours may be mutually useful to each other. For example: suppose the mother of a family living in the larger cottage has occasion to go from home during the absence of her husband at his work, she may leave the key and her younger children with the old woman in the next house. It also facilitates attendance on divine worship, as the two families might alternately heat their ovens on Sundays, and one of the women might remain at home, to take care of the dinners for both houses, and have an eye to the gardens; a very necessary precaution in most English villages, particularly in the fruit season. Besides these obvious advantages, there is a feeling of security and cheerfulness in having a near neighbour, especially to an old couple, who must often stand in need of assistance. In closely built villages, three cottages may occasionally be united; but this number should never be exceeded; avoiding, above all things, that school of idleness, dirt, and wickedness, a continued row of cottages: —

'That infected row, they call the street,

as Crabbe happily expresses it; in which are commonly found the bad habits of a crowded city population; and where one dirty, quarrelsome, gossiping woman generally annoys or contaminates all her neighbours. Not that rows of houses are necessarily unpicturesque; for, though modern rows are usually frightful, streets of contiguous houses may be found in many old villages in England, which have an exceedingly pleasing effect. The principal objections to rows are, indeed, the demoralising effect they generally have upon the inhabitants, and the preference which almost all the well-disposed poor give to a detached house, or to only one or two neighbours."

371. *Criticism.* We cordially approve of the reasons given for designing this double cottage. The evils of streets, in the present state of our working population, are no doubt great; because the labouring classes have as yet no idea of co-operating together either for enjoyment or advantage. If they had, as we shall hereafter show, the assemblage of houses in streets and squares to a certain extent, even in villages, would be attended with very great advantages. In a country where fuel is abundant, or the winter mild, as it generally is in Wiltshire the county for which this cottage was designed', fires will seldom require to be made in the bed-rooms, and a flue under the kitchen floor will not be necessary. All the chimneys are well contrived to unite in one cluster of angular stacks; and this is judiciously placed in the interior, and not in the outside walls. The projection of the framework of the upper part of the walls, over the stonework of the lower, is both scientific and picturesque; because it will preserve the windows from the rain, and produce a striking horizontal line of shade across the elevation. Besides, when one object is placed upon another, we are pleased to see it either projecting outwards, like the capital of a column; or inclining inwards, at a regular slope, like the sides of an obelisk or pyramid. The source of the beauty lies in the evidence, which, in either case, is afforded, of the exercise of improved design. We do not altogether like the porch, which a stranger might mistake for some inferior appendage. A porch being, to a certain extent, a luxury, should, we think, be generally in a conspicuous style of art, compared with the rest of the building. Perhaps, also, the oriel window is rather too insignificant; but this might easily be remedied, by raising it at top, and lowering it at bottom. This done; the porch altered; and the whole placed on a platform, so as to keep the interior perfectly dry; the effect would be to us altogether satisfactory.

Design LV. — *A Cottage of One Story, with Four Rooms, a Kitchen, Back Kitchen, and other Conveniences*

372. *Accommodation.* There are a large lobby, *a*, and kitchen, *b*, with a closet between; bed-room, *c*; parlour from the lobby, *d*; three bed-rooms, *e*, *f*, and *g*; cow-house, cellar, or place for wood, *h*; dairy, *i*; pantry, *k*; and privy, *l*.

373. *Construction.* The walls, in such a building as the present, may be all formed of mud; because they have nothing more to carry than their own weight, and that of the roof. The weight on them of the latter, which is thatched, is diminished on three sides by the columns of the veranda, or, as the Romans would have called it, the portico. Such a design is also particularly suitable for brick on edge walls; and having already (§ 336) explained Dearn's method of building such walls, we shall now describe a similar kind, invented by Mr. Silverlock of Chichester, and practised by him in the erection of garden walls, hot-houses, and cottages.

374. *Silverlock's hollow walls* are constructed of bricks set on edge, each course or layer consisting of an alternate series of two bricks placed edgewise, and one laid across; forming a thickness of nine inches, and a series of cells, each cell nine inches in the length way of the wall, four inches broad, and four inches and a half deep. The second course being laid in the same way, but the position of the bricks alternating, or breaking joint with the first, the result will evidently be a hollow wall, with communicating vacuities of the above-stated dimensions, equally distributed from the bottom to the top of the wall.

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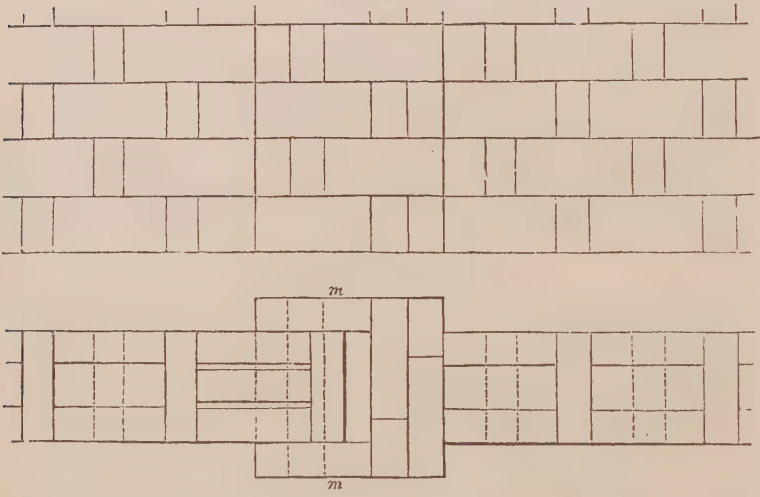

Fig. 329 shows the plan and elevation of such a wall, which differs only from the hollow wall of Dearn (fig. 306.) in being carried up in Flemish instead of English bond. At *m* is shown the manner in which piers may be built in such walls, so as to project equally on both sides of the wall, with a view to the north and south walls of gardens, both sides of which are equally valuable for training fruit trees. Fig. 330 shows how a pier may be built on one side of the wall only, with a view to the east and west walls of gardens, the south sides of which are chiefly valuable for fruit trees, and to the walls of cottages, which should be made smooth in the inside; while, on the outside, the piers, independently of the strength which they add to the walls, will form sources of architectural beauty. These walls have been built by Mr. Silverlock in a number of places, as garden walls, to the height of ten or twelve feet, and with very few piers. The saving is one brick in three; but the bricks and the mortar must be of the best quality. One great advantage of

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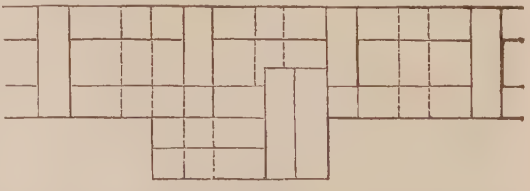

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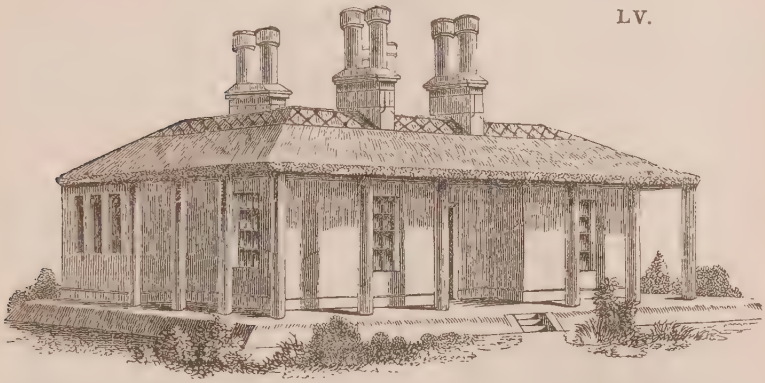

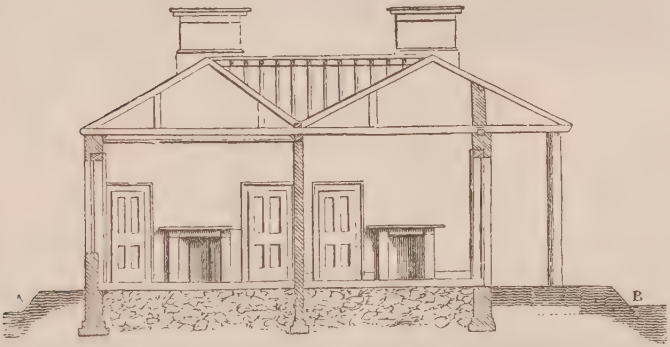

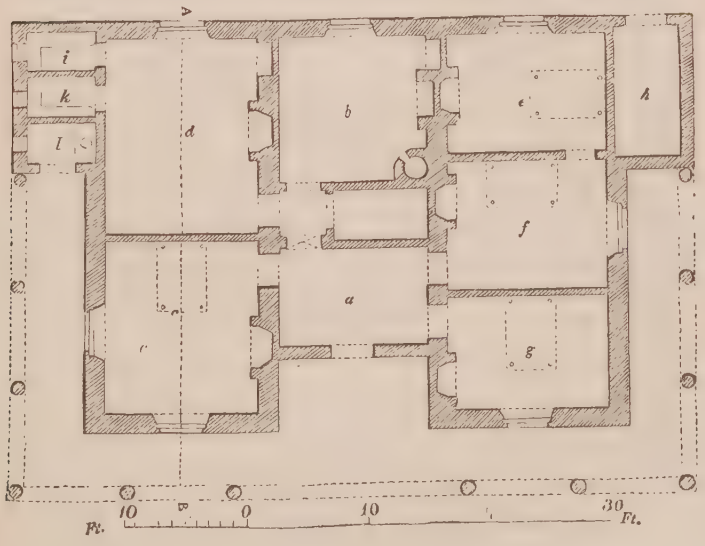

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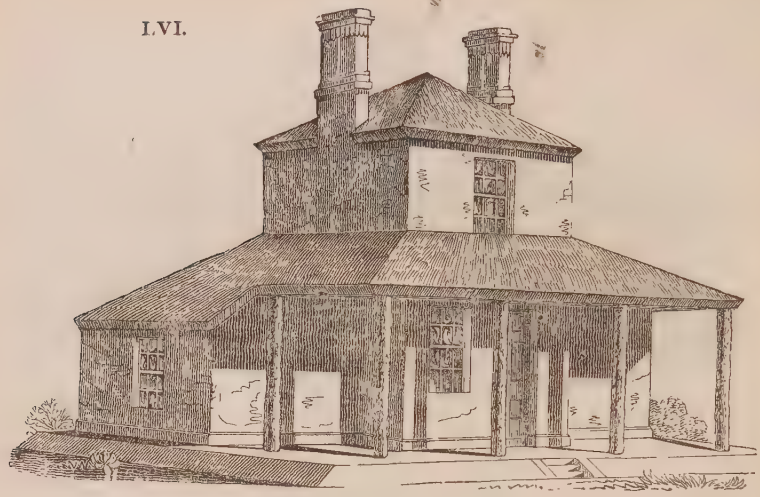

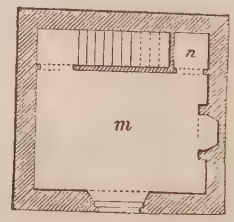

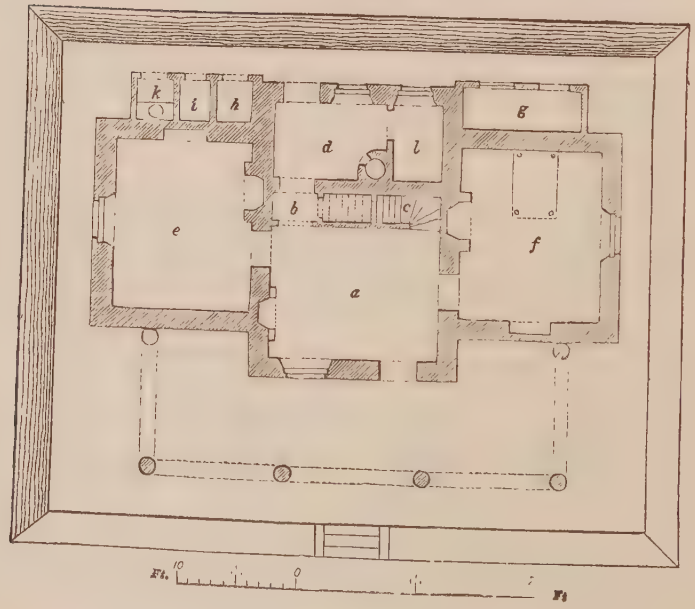

these walls is, that they admit of being equally heated throughout, by a tube of hot water or steam conducted along the interior, just above the surface of the ground. Several cottages have been built with walls of this description, on the estate of Robert Donald, Esq., near Woking, Surrey. It is evident that brick walls on the same plan might be built of eighteen inches or two feet in width, or, indeed, of any width, by joining two nine-inch hollow walls together, as in fig. 331, which, if a garden wall, might be heated

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on one side, without being heated on the other; by carrying up the heading courses solid from the bottom, as in fig. 332; or, better, with a brick on edge wall in the centre, as in

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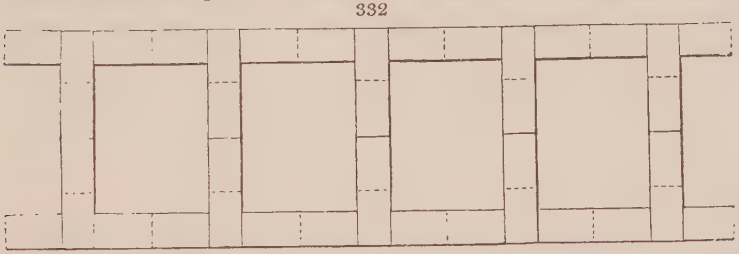

fig. 333. A wall of this construction, with the bricks flat, would form one of the very cheapest and best descriptions of walls for a fruit-garden. For a fourteen-inch wall

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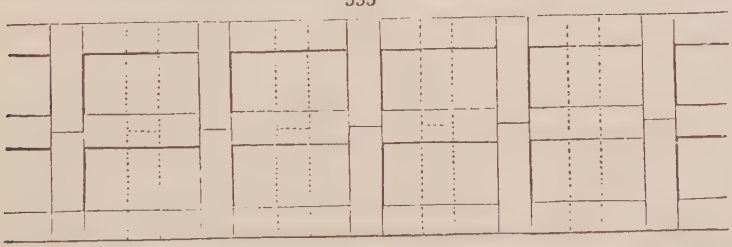

bricks might be made of that length, as proposed by Dearn; and, for a wall two feet or more in thickness, the interior might be entirely hollow, with cross walls every four or five feet, as shown in *Gard. Mag.*, vol. iv. p. 228. To save bricks in the cross walls, and also to admit of the free transmission of heat from one division to another, they might be built in what is called the pigeon hole manner, viz. each stretching course having alternate vacancies, by leaving out every other brick, as in fig. 334.

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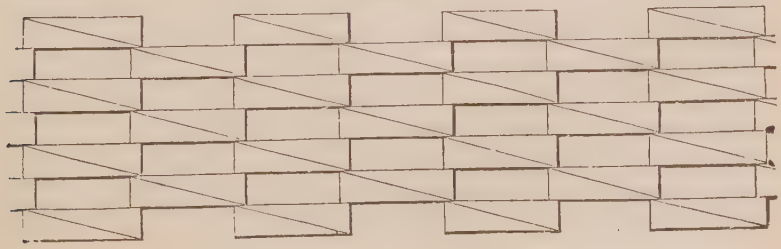


375. *General Estimate.* Cubic contents, 29,348 feet, at 6*d.* per foot, £733 : 14*s.* : at 4*d.*, £489 : 2*s.* : 8*d.* ; and at 3*d.*, £366 : 17*s.*

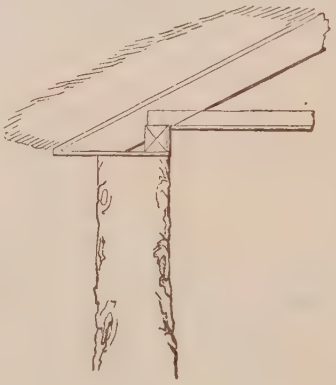
376. *Remarks.* The veranda in this Design being an object of luxury, or at least of elegant enjoyment, the wooden columns ought to have had plinths and caps, and the steps to the platform an air of more consequence conferred on them. However, the general form of this building, being that of a cube, is good, and the idea of the veranda on three sides is highly commendable.

Design LVI. — *A Dwelling of Four Rooms, with other Conveniences, and a large Rustic Portico.*

377. *Accommodation.* The entrance is direct into the kitchen, *a*, from which there is a passage, *b*, to the back kitchen, and to the cellar stairs; staircase to the bed-room, *c*; *d* is the back kitchen, from which there is a pantry, *l*; *e* is the parlour; *f*, a bed-room, or second parlour, in case this building should be made a public house, for which the large space under the portico is well adapted; *g* may be a place for fuel; *h*, a dusthole; *i*, a place for ducks or other poultry; and *k*, a privy. On the chamber floor there are a good bed-room, *m*, and a closet, *n*.

378. *Construction.* The walls are shown of sufficient thickness to admit of their being built of rammed earth; but we are informed, by the contributor of this Design, that it is erected as a small public house by the roadside in South Wales; and that the walls are actually formed of the land-stones of the country, thickly coated over with plaster within, and covered with rough-cast without. The columns which support the portico are of native larch fir, with the bark on, joined to the roof in the manner shown in the section, fig. 335, to a scale of half an inch to a foot. The roof is first thatched with straw, and then finished with a coating of heath over it. The ground floor of the house is raised about eighteen inches above the surface, and the floor of the portico about one foot above the surface. We have shown the ground on which the portico stands, higher in the Design, thinking one foot insufficient, either for the purpose of dryness, or of dignity of effect.

335



379. *General Estimate.* Cubic contents, 14,798 feet, at 6*d.* per foot, £369 : 19*s.* ; at 4*d.*, £246 : 12*s.* : 8*d.* ; and at 3*d.*, £184 : 19*s.* : 6*d.*

380. *Remarks.* There is comfort in this building, and also economy. The three cellars under *a*, *e*, and *f*, (which have no light, or means of ventilation, in order to lessen the risk of variations of temperature,) are well adapted for a public house, as is the pantry or store-room from the back kitchen. The presses shown in each of the rooms are also very suitable for a public house, being well adapted for holding glasses and china or earthenware. The apartment *g*, though used for keeping fuel, may be very properly substituted for a stable; though this public house does not belong to the class of occupiers who receive travellers on horseback, for the night. It is needless to add that the great width of the portico affords an excellent protection to guests enjoying themselves in the open air. Having said thus much of the fitness of this building, with reference to its use, we shall next consider its fitness, as expressive of architectural design. It is an acknowledged principle, that whatever idea obviously pervades a building, taken as a whole, ought also to pervade all its separate parts. If the idea of the whole were that of an irregular mass, the parts ought to be irregular also; if the whole were regular, or symmetrical, so ought to be the parts, and not only the parts, but their details. We do not say that these principles ought to be enforced in every building, whether or not they be consistent with comfort or convenience; but we do assert that it is the main business of the Architect to accomplish this object, whenever it can be done without sacrificing the higher principle of purpose; and that it is his duty to aim at this in the very smallest and most humble buildings, as well as in the larger and more important ones. Now, on looking at the ground plan of the Design before us, we shall find that the entrance front and the back front are regular and symmetrical in their general masses, and yet irregular in the details of these masses; that is, in the disposition of the doors and windows. In the apartment *a*, for example, the entrance door is on one side, and a window on the other; whereas, to preserve the principle of symmetry, the door ought to have been in the centre, with a window on each side: and this arrange-

ment would have been more suitable for a room, the windows of which must necessarily be darkened by having so wide a portico over them. Again, the doors from this room into *e* and *f* ought to have been opposite to each other, in order to maintain the same principle. There ought to have been another press, both in *e* and *f*; and the fireplaces ought to have been exactly opposite the windows in both of them. In the back kitchen, the press door ought to have been exactly opposite the door of the pantry; the outer door to have been in the centre; and the window, now there, in the position of the door. These alterations would render every thing regular, but the two small lean-tos containing *g*, *h*, *i*, and *k*. The doors of *g* and *k*, at present, answer to each other. Remove the partition between *i* and *h*; reverse the positions of the window and door of *g*; let the door of *k* be in one end; turn its present door into a window, to correspond with that of *g*; build up the door of *i*, and take down the partition between it and *h*, thus forming a dusthole and place for poultry in one apartment; and the thing is done, with a door less, and only one additional window, and without the slightest interference with the use of any one apartment. As minor faults in this Design, we object to the columns (even though they are nothing more than the trunks of trees with the bark on), for not having stone plinths and wooden caps. The former are of real use, in preventing the ends of the wooden columns from rotting, and of apparent use, by seeming to take a larger bearing on the surface of the soil; though this is rendered unnecessary, in reality, by sunk stones, or masonry, brought up as high as the surface. The wooden caps always give, or seem to give, a more secure bearing for the wall-plate or architrave, which is placed over them, besides protecting the end of the wooden column from the weather. Both the caps and the plinths have also the great advantage of calling forth the associations which belong to them, as parts of the orders of Grecian Architecture. It ought to be the maxim of all architectural improvers, never to neglect an established association, when it can be made use of without interfering with the principles of fitness and expression of purpose.

Design LVII. — *Two Dwellings under One Roof, Two Stories high, with Four Rooms in each, and other Conveniences.*

381. *Accommodation.* Each dwelling contains an entrance, and stair to the bed-room floor, *a*; kitchen, *b*, with closet under the stairs; small bed-room, or parlour, *c*; pantry, *d*; back kitchen, *e*; place for fuel, *f*; dusthole, *g*; privy, *h*; and root-cellar, *i*. The chamber floor contains two bed-rooms, *k* and *l*, with a closet to each, *m* and *n*; and a staircase, *o*.

382. *Construction.* The most suitable material for a building having so many internal walls is brick. The outside walls may be eleven-inch work, with a vacuity between, as shown in fig. 7, § 25; and all the others may be brick nogging on edge, with the exception of the party walls, which may be brick nogging flat, and of the chimney stacks, which should be solid brickwork. The roof is shown covered with semi-cylindrical tiles, which, though they are much used in Italy, and commonly called Italian, are, in reality, Moorish, and, as we are informed, the oldest description of tiles in the world. In Barbary, they are bedded in clay, laid on reeds.

383. *General Estimate.* Cubic contents of both houses, 22,050 feet, at 6*d.* per foot, £551 : 5*s.*; at 4*d.*, £367 : 10*s.*; and at 3*d.*, £275 : 12*s.* : 6*d.*

384. *Remarks.* We have engraved this Design as it was sent to us; because, though it is full of faults, it contains the germs of great beauty and interest; and because it affords a very good example of the kind of impracticable Designs which are frequently made by picturesque architects or amateurs. The plan is so far commendable, that all the apartments and appendages are obtained under one roof, and that the general form is symmetrical; but, in the ground plan, it is bad to have a place like *f*, without the means of either light or ventilation. It would be much better to divide the contents of that apartment between *g* and *c*, which could easily be done, by making the division *h* narrower, and that of *i* shorter. The division *g* would then serve its own purpose, and that of *f* also. The two false windows shown in the plan of the ground floor, and the two in the plan of the bed-room floor, which are seen in the elevations of both, are uncalled for, and add to the expense, without being requisite to carry on any idea of symmetry. The small windows shown in the ground plan, close to the staircase, are, or ought to be, intended for lighting the closets under them; but in the elevation they are placed much too high for that purpose, being even higher than the windows of the apartments *b* and *c*. Placed where they are, they could only light the staircase, which is superfluous, as this is already done in an ample manner by the broad mullioned windows over them. The boilers in the back kitchen are also badly placed, because they are against an outside wall, instead of an inner one; in which last case their heat would have served to increase the temperature of the interior, instead of being in a great

measure lost in the atmosphere. The divisions *g* and *h* should obviously be transposed; because the one would be improved by heat, and the other injured by it. In the chamber floor, a division wall is shown, so as to give to each house its portion of the balcony; but this division wall appears by the shading to be entirely omitted in the elevation. A protecting railing is also wanting to this balcony, and the windows in the elevation should

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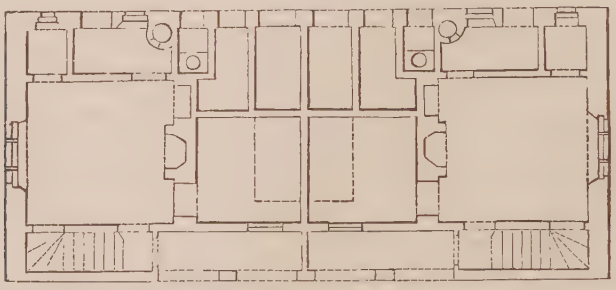

come down to the floor. Finally, the chimney stacks are too low, and the shafts too short, for grandeur and elegance of effect. We would change the plan as in fig. 336, and the elevation as in fig. 337.

337

Design LVIII. — *A Labourer's Cottage of Two Rooms, with other Conveniences.*

385. *Accommodation.* The plan, fig. 338, shows a porch, *a*; kitchen, *b*; with pantry *c*; bed-room, *d*; and light bed-closet, *e*. The privy and other conveniences, such as pigsty, cow-house, &c., are supposed to be placed in a small yard at a short distance.

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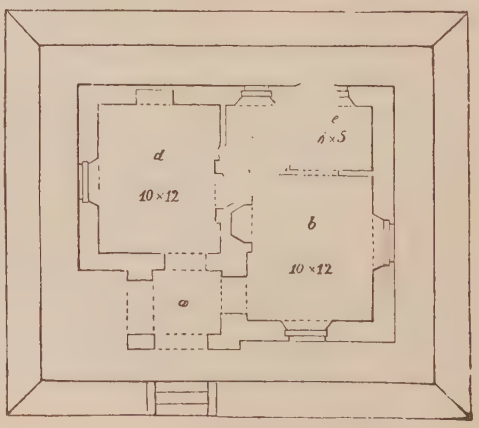

386. *Construction.* The walls may be built of compressed earth. The floors should be formed by loose stones, and finished with a mixture of quicklime and sharp sand; on the supposition that this construction in the given situation would not be too cold for the inhabitants. In a country where bricks are to be obtained at a moderate cost, the piers of the doors and windows, and the inner sides of the walls, might be built of them; and the main body of the

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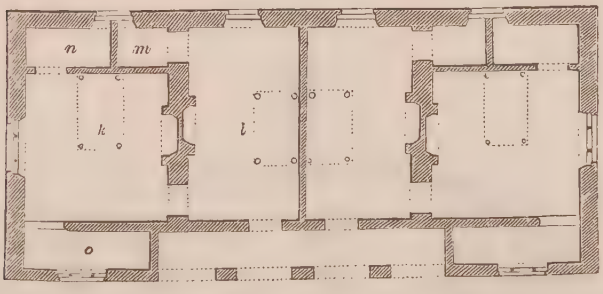

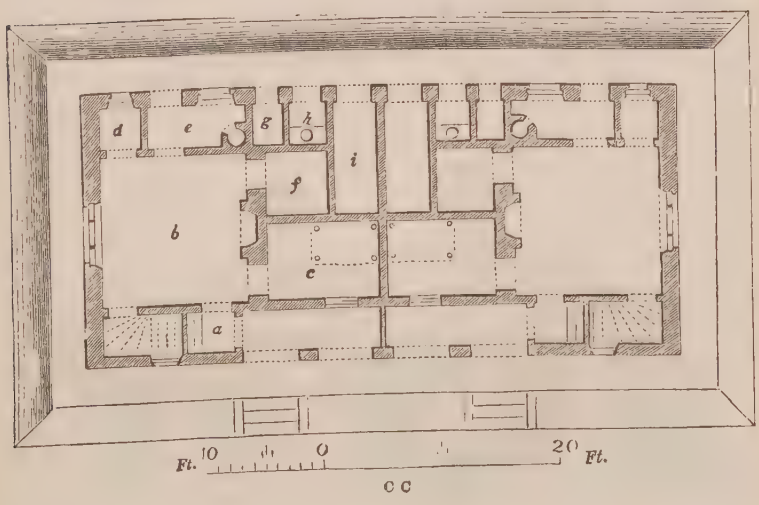

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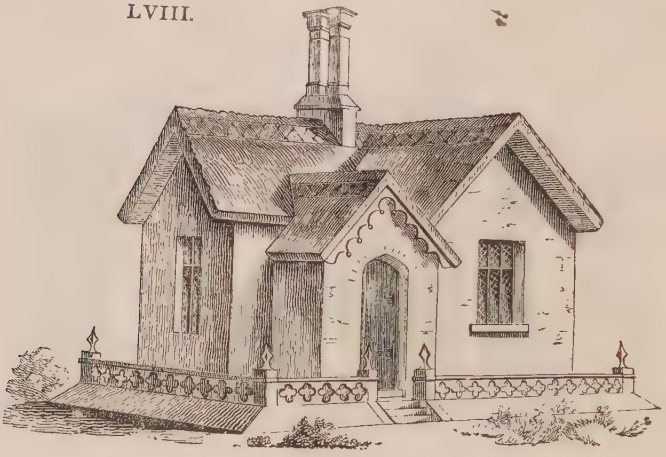

LIX.

LX.

wall afterwards filled in with mud, or turf, or rustic work, rough stones of any kind, or straw, heath, or reeds, to keep out the heat in summer, and to keep it in during winter. One fireplace might, by means of a cast-iron back, be made to serve both apartments, and an oven and boiler might be added. It is evident, that, by this mode of proceeding, a very comfortable interior might be included in a very simple, picturesque, or grotesque exterior. The brickwork of the interior, and of the doors and windows, being arranged, as in the ground plan (fig. 339, to a scale of $1\frac{9}{16}$ of an inch to ten feet), no interior

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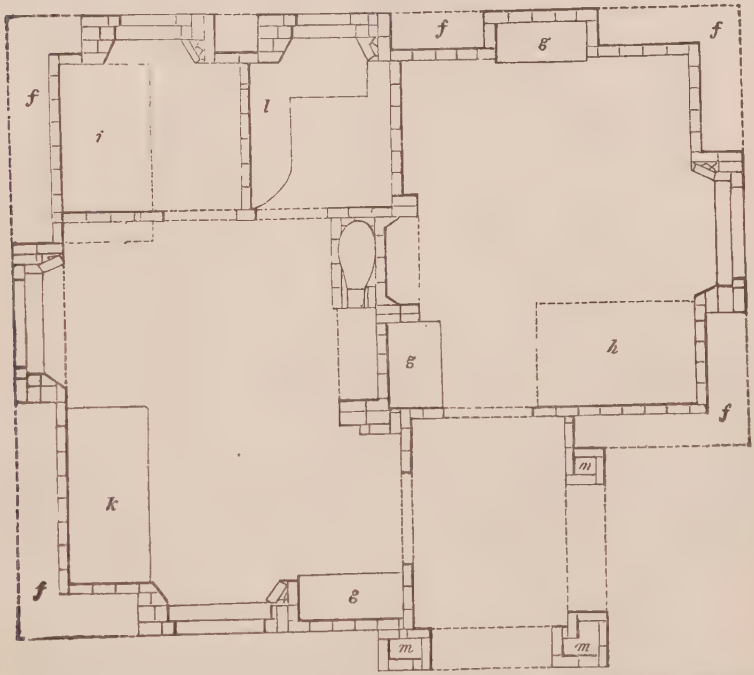

plastering would be required, provided rubbed bricks were used. This adds greatly to the durability of the surface of rooms, and prevents them from being injured by children, and idle people, in countries where the labouring classes are not yet accustomed to comfortable dwellings. In this ground plan, fig. 339, *f f f f f* are the outside spaces, to be filled up with turf, rammed earth, rubble work, or whatever may be most economical in the given situation; *g g g*, inside spaces, to be fitted up as closet cupboards; *h*, bed; *i*, bed, with the foot projecting into a cupboard or small dresser in the kitchen or living-room, in the manner represented in fig. 143, § 171; *k*, dresser; *l*, pantry shelves; and *m m m*, piers of the porch built hollow. All the doors must necessarily have door-frames, with projecting heads or lintels, and sills, in order that they may build into the four-inch work. There should also be wooden bricks built in the door-jambs, to which the door-frames are to be nailed; and there must be a strong wall-plate to rest on the four-inch work, for the sake of equalising the pressure of the roof. Much may be done, in point of economy, by adopting this mode of building the walls of a house; and by using corrugated iron roofs, corrugated iron panels for the doors, and flues for heating, either under the floors, or as benches over them, in the Chinese manner, to be afterwards described.

387. *General Estimate.* Cubic contents, 8696 feet, at 6*d.* per foot, £217 : 8*s.*; at 4*d.*, £144 : 18*s.* : 8*d.*; and at 3*d.*, £108 : 14*s.*

388. *Remarks.* This cottage is not without comfort; and it would be improved, in point of architectural effect, and executed at less expense, if the porch were included under the same roof. We say, it would be improved in architectural effect, because the roof and ground plan would be more symmetrical, and symmetry is the soul of Architecture; but it would not be so picturesque as it now is, because the soul of that beauty is irregularity.

Design LIX.—*Two Cottages, of One Room and a Back Kitchen each, under the same Roof.*

389. *Accommodation.* Each dwelling contains an entrance lobby, which serves also as a place for fuel and tools, fig. 340, *a*; a kitchen, *b*; back kitchen, *c*; a place for keeping potatoes, or for poultry or a pig, *d*; and a privy, *e*.

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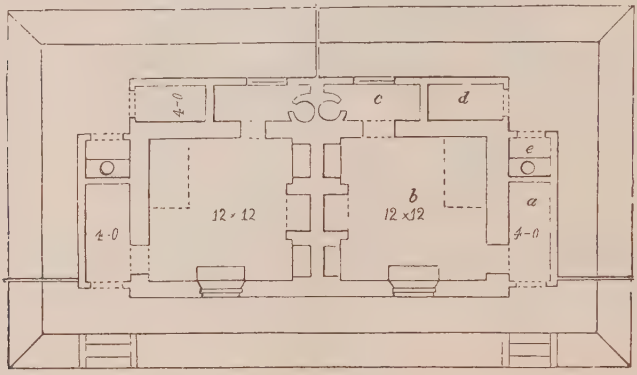

390. *Construction.* The walls may be of stone; but brick walls, built hollow, would be greatly preferable. The roof may be slated. If desirable, the kitchen floor may be heated by a flue from under the oven in the back kitchen.

391. *General Estimate.* Cubic contents of both dwellings, 9110 feet, at 6*d.* per foot, 227 : 15*s.*; at 4*a.*, £151 : 16*s.* : 8*d.*; and at 3*d.*, 113 : 17*s.* : 6*d.*

392. *Remarks.* It is sufficiently obvious that the expression of this design is that of the subject. Each dwelling can only be fit for a single person; and the building must be favourably situated, in regard to a dry soil and free air, to admit of sleeping on the ground floor. As it is desirable, in cases where the sitting-room is also a bed-room, to have the bed in a recess, or of such a form as not to offend the eye of those who are not accustomed to live in bed-rooms, a press-bed may be employed.

Design LX. — *Two Dwellings, under One Roof; each containing Four Rooms, with Back Kitchen, and other Conveniences.*

393. *Accommodation.* Each house contains a kitchen, fig. 341, *a*; back kitchen, *b*; parlour or bed-room, *c*; bed-room, *d*; large bed-room, *e*; closet, *f*; pantry, *g*; privy, *h*; dusthole, *i*; and place for fuel, *k*: or the smaller apartments may be differently

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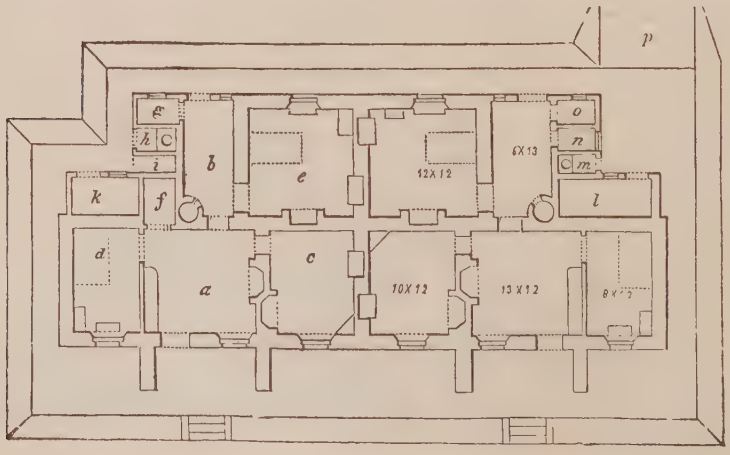

arranged; thus, *l* may be a cowhouse, formed out of *f* and *k*; *m*, a privy; *n*, a dairy; and *o*, a pantry. With this arrangement, the platform will require the alteration indicated at *p*.

394. *Construction.* The walls may be of brick or stone, and the roof thatched. One roof covers the whole of the apartments belonging to both cottages, without any guttering, and with only two hips, or pavilion ends. Roofs so simple are particularly eligible for being covered with zinc, or sheet iron, instead of tiles or slates.

395. *General Estimate.* Cubic contents of both houses, 24,660 feet, at 6*d.* per foot, £616 : 10*s.*; at 4*d.*, £411; and at 3*d.*, £308 : 5*s.*

396. *Remarks.* These are comfortable, unobtrusive dwellings, expressive of nothing more than what they are. All that we should wish to alter in this Design, would be the projections of the roof in front, which we would form into one general veranda, and return it also at the ends.

Design LXI. — *A Dwelling of Three Rooms on the Ground Floor, with a Back Kitchen, and other Conveniences.*

397. *Accommodation.* The ground plan, fig. 342, contains a back kitchen, *a*; a principal kitchen, or living-room, *b*; a best bed-room, *c*; another bed-room, *d*; with a closet, *e*; a pantry, *f*; a dairy, *g*; a place for fuel, *h*; privy, *i*; and cow-house, *k*.

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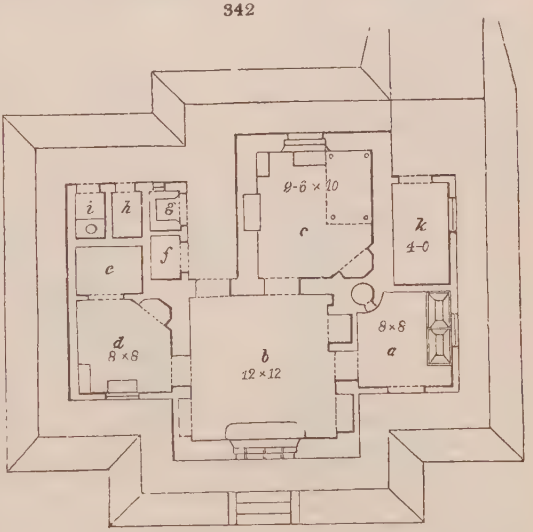

398. *Construction.* The walls are supposed to be of stone; the roof thatched, and the chimney stacks in square divisions, as in fig. 343, on a scale of half an inch to a foot; the principal window, Gothic, with labels and mullions, as in fig. 344; on a scale of three eighths of an inch to a foot. The chimney stacks as represented in fig. 343., will, as building is now carried on in Britain, require to be executed in natural stone, artificial stone, or in brick covered with cement; but, if the practice of employing ornamental chimney tops of this kind were general, they might be formed at every pottery of common tile ware, at half their cost in cement. Indeed a great deal is to be done in the commonest earthenware, not only in the way of chimney tops, but in cornices, labels to windows, string courses, mouldings, ornamental roof and weather tiling, and even in the internal finishing of kitchens, wash-houses, porches, &c.

399. *General Estimate.* Cubic contents, 9415 feet, at 6*d.*, £235 : 7*s.* : 6*d.*; at 4*d.*, £156 : 18*s.* : 4*d.*; and at 3*d.*, £117 : 13*s.* : 9*d*

400. *Remarks.* There is something mean and depressed in the elevation of this building; though, to some tastes, this would be a recommendation to it, as a cottage. It is evident, that the main study of the Architect has been picturesque effect, else why so much irregularity, both in the masses of the ground plan, and in the roof? We do not like the truncated gables; but there can be no doubt that precedents are to be found for them. We have before observed that some Architects consider their art as one of imitation, even in its higher departments; and it is certain that the department of Cottage Architecture has been hitherto much more one of imitation than of improved design. " The general character of a cottage, as distinguished from that of dwellings of a higher class, is considered by Architects to consist in low walls, and of course low ceilings, in small windows rather broad than high, and in conspicuous high-pitched roofs, often with dormer windows in them. We admit, that, taking cottages as they are usually constructed, these features may be said to establish their character; and hence they are

generally employed by painters, and by poets, or other descriptive writers, who wish to portray a cottage of the present day. In the like manner, a certain degree of coarseness or homeliness of dress and manner may be said to have hitherto characterised the British labourer, as contradistinguished from the British gentleman. A romantic writer would, therefore, make use of these characteristics; and a poet or a sentimentalist might probably regret their disappearance, and the gradual assimilation of dress and manners between the labourer and the gentleman. The fault of the Architect is, that he has too closely followed the painter and the man of literature; forgetting that his art, being founded upon and guided by utility, ought to embrace all improvements, not only in Architecture, but in the uses of buildings, as they are brought into notice. It is surely the duty of landed proprietors who build cottages, to encourage and elevate the character of the people who live on their lands; and that of the Architect, in conformity with this object, to consider, not what a cottage has hitherto been, but what it is capable of being made. Putting a servant into a handsome Gothic cottage, is like putting him into a handsome suit of livery; but there is, unfortunately for the servant, this difference, that the faults of the dwelling, if it does not fit, cannot be so readily perceived as those of the coat; and nobody may know, but the occupant and his family, how little comfort sometimes exists under a gay exterior. For our own part, we have seen so many ornamental cottages and lodges on gentlemen's estates, both in England and Scotland, small, damp, and badly contrived within, that we are compelled to consider them as much badges of slavery as a suit of livery. Let us hope that another generation will effectually simplify and improve the former, and entirely abolish the latter. We are aware that there is a great prejudice in favour of Gothic buildings of every description, from the cottage to the palace; arising from the associations of reverence, antiquity, and chivalry, which are connected with them. Maturely considered, however, we cannot help sometimes doubting whether the existing prejudice in favour of Gothic Architecture does not reflect more discredit than honour on human nature: at all events, it is a prejudice unworthy of an age of rapid improvement like the present. We freely acknowledge that we do not expect many converts to our views in this respect; because simplicity is one of the last refinements men arrive at, not only in the progress of the arts, but in the progress of opinion. Believing, as we do, that this principle is undeniable, we have little doubt but that much of what is now considered beauty, both in art and in literature, will, by the next generation, be neglected; and, as the French characteristically express it, "réduit au mérite historique." (*Gard. Mag.*, vol. viii. p. 260.)

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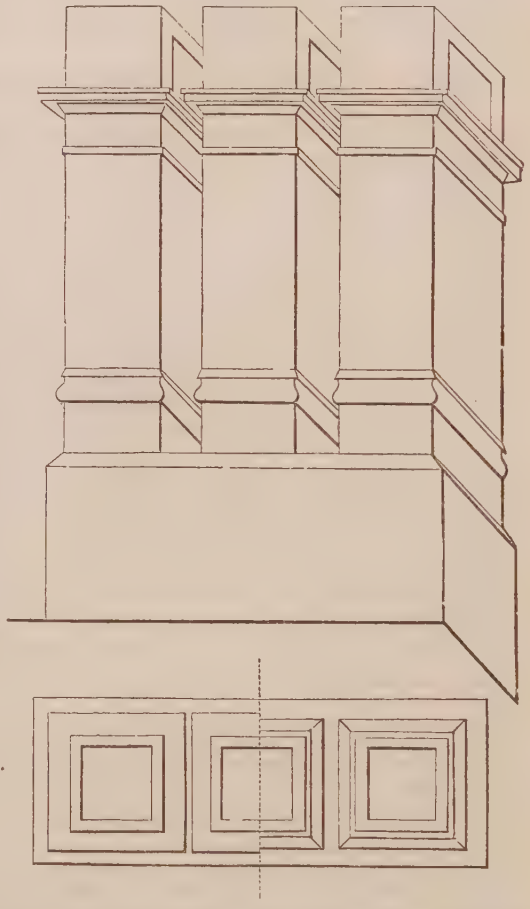
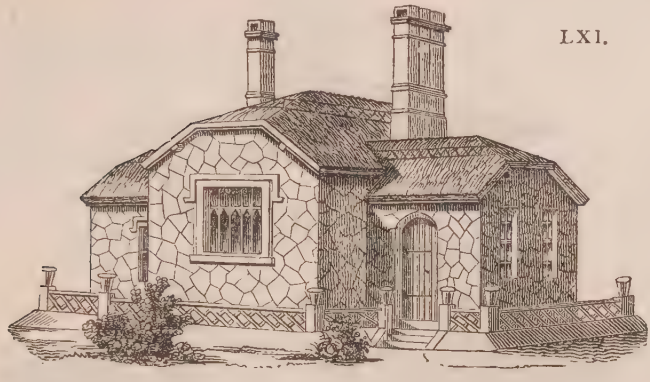


LXI.



LXII.

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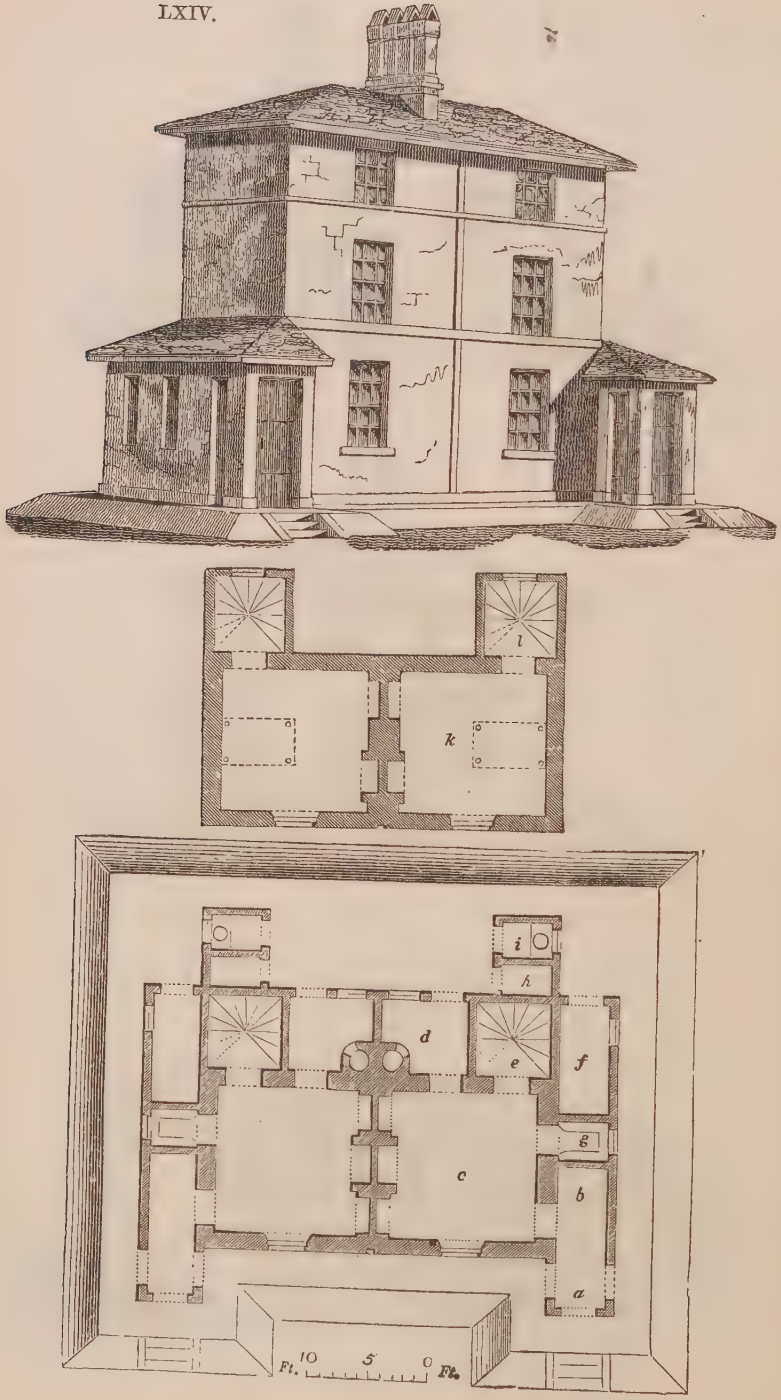

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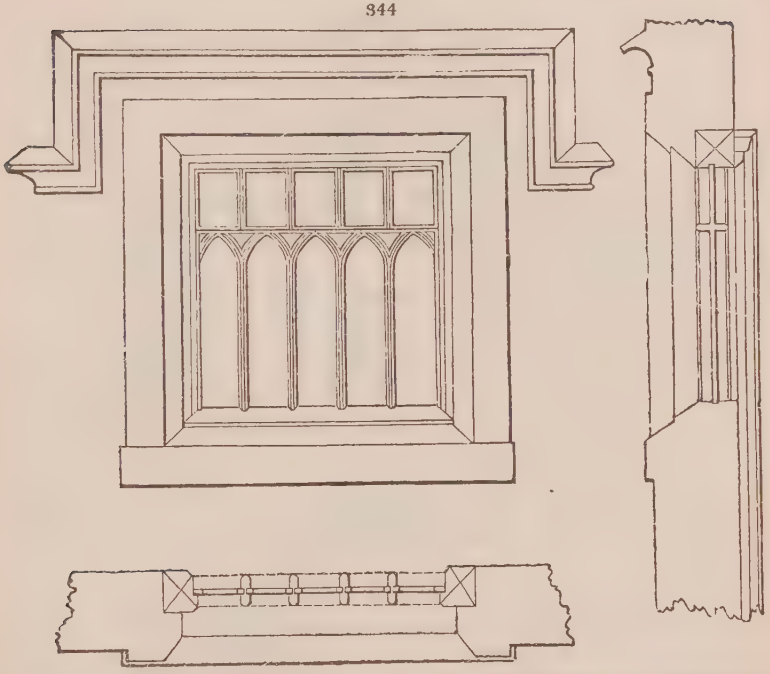

Design LXII. — *A Dwelling of Four Rooms on Two Floors, with various Conveniences.*

401. *Accommodation.* In the ground plan, fig. 345, there are a porch, *a*; kitchen, *b*; back kitchen, *c*; parlour, *d*; light bed-closet, *e*; root-cellar and lumber room, *f*; privy, *g*; pantry, *h*; and place for fuel, *i*. The stairs, *k*, lead down to a small cellar under *e*, and up to two good bed-rooms over *d* and *b*

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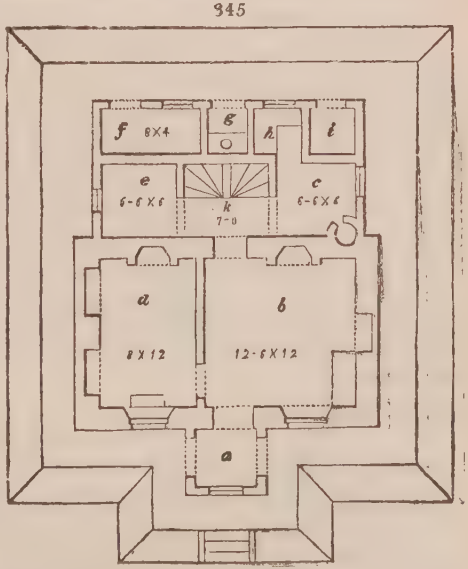

402. *Construction.* This dwelling, as an edifice, consists of three parts: one of these is two stories high, and contains the kitchen, the parlour, and the bed-rooms; another is a lean-to, containing the smaller apartments on the ground floor; and the third is the porch. The walls of the first part may be of brick or stone; but those of the other two parts, being much narrower, ought to be built of brick, or of nogging; or, if necessarily of stone, they should be double the thickness shown in the plan. The roof is covered with Grecian tiles, and all the flues are brought into one chimney stack. The door of the porch should be varied in position, according to the aspect of the entrance front, and to the prevailing winds of the country, as before directed.

403. *General Estimate.* Cubic contents, 11,692 feet, at 6*d.* per foot, £292 : 6*s.*; at 4*d.*, £194 : 17*s.* : 4*d.*; and at 3*d.*, £146 : 3*s.*

404. *Remarks.* On the supposition that this house is to be seen principally in front, we consider it handsome; though, if it were to be seen alike on every side, it would be the reverse. The front part of this dwelling consisting of two stories, and all the windows, both of the ground floor and of the bed-room floor, being in front, the lean-to containing the inferior apartments may be well considered as the subordinate part of the building; whereas, in perfect designs, whatever meets the eye, whether in the back or front, ought to be noble. Placed on the outskirts of a wood, or half surrounded by an orchard, in the manner shown in fig. 260, § 280, it would be unexceptionable.

Design LXIII.—*Two Dwellings, of Two Rooms each, under One Roof.*

405. *Accommodation* In the ground plan, fig. 346, there are shown, for each of these dwellings, a porch, *a*; kitchen, *b*; bed-room, *c*; back kitchen, *d*; pantry, *e*; place for fuel, *f*; and privy, *g*.

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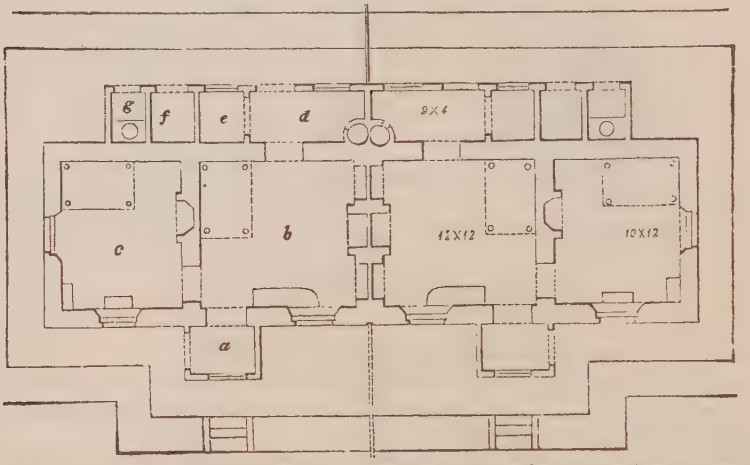


406. *Construction.* Nothing appears to require notice under this head, which may not be gathered from preceding designs; we may remark, however, that porches of the kind here shown, in many parts of the country, might be covered with lead, cheaper than they can be with slate, because in each of these porches there is not only a gutter between the roof of the porch and the roof of the main body of the house, but four ridge pieces on the hips, which must be covered with lead. The cheapest way, however, would be to make the porches lean-tos, when no lead would be required, but only boards at the sides. Chimney pots, such as fig. 347, on a scale of three quarters of an inch to a foot, may be used.

407. *General Estimate.* Cubic contents of both houses, 15,606 feet, at 6*d.* per foot, £390 : 3*s.*; at 4*d.*, £260 : 2*s.*; and at 3*d.*, £195 : 1*s.* : 6*d.*

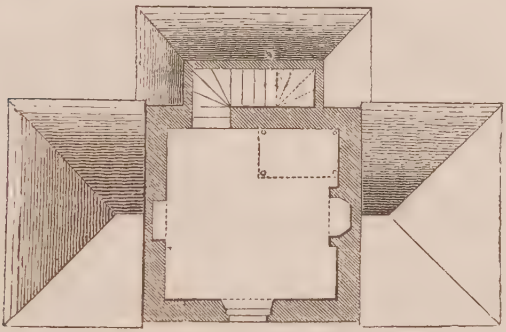
408. *Remarks.* This Design, like the preceding one, is chiefly calculated for being seen in front, and, on the whole, though it has no pretensions in regard to style, we think it satisfactory.

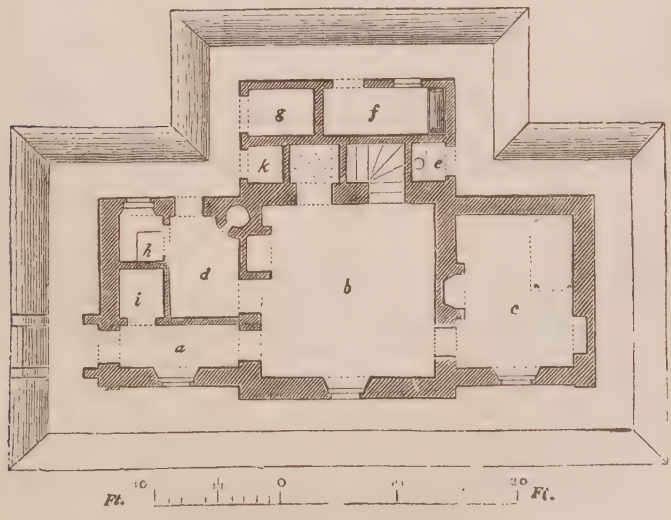
Design LXIV. — *Two Dwellings under One Roof, each Three Stories high, and having Three Rooms, and other Conveniences.*

409. *Accommodation.* The ground plan exhibits an entrance porch, *a*; with a place for fuel or tools, *b*; kitchen or living-room, *c*; back kitchen, *d*; staircase, *e*; cow-house or root-cellar, *f*; dairy or pantry, *g*; pigsty or dusthole, *h*; and privy, *i*. Each of the chamber floors contains one good bed-room, *k*; and a landing from the stair, *l*.

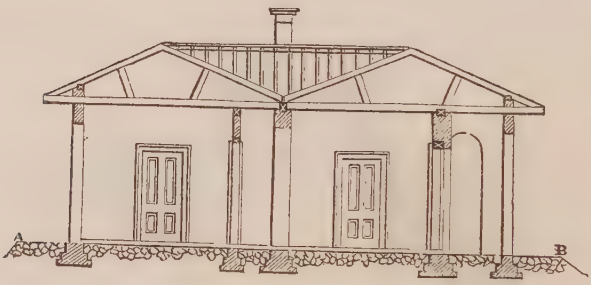
410. *Construction.* The walls must necessarily be of brick, or of tooled stone; and the roof, being at a low pitch, should be slated. Should red harsh-coloured bricks be employed, they may be changed to a mellow tint, by a wash of quicklime, yellow ochre, and black; or the effects of time may be anticipated by a grey moss-coloured tint, composed of lime and black only. There is also a mode of imitating weather stains,

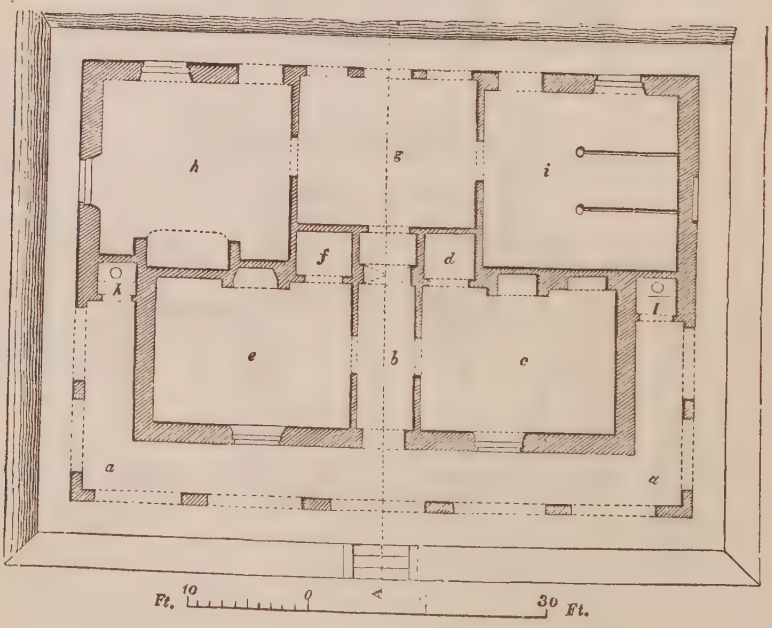
LXV.





LXVI.





technically called splashing, which will be described hereafter, as being more applicable to cottages in the Gothic style, than to the present town-looking edifice.

411. *General Estimate.* Cubic contents of both houses, 21,906 feet, at 6*d.* per foot, £540 : 3*s.* ; at 4*d.*, £360 : 2*s.* ; and at 3*d.*, £270 : 1*s.* : 6*d.*

412. *Remarks.* This Design, we are informed, is actually executed, with the exception of the platform. The situation is on the side of a road which passes through a high wood, on the steep slope of a hill in Devonshire. The object of the third story is said to be to show a part of the cottage above the trees, from the windows of the mansion of the proprietor of the estate, who resides in the vale below. This circumstance shows how much of the beauty of cottages must always be relative ; because, by itself, no one, we will venture to assert, would consider this a handsome building. The two wings or lean-tos are too small to become even secondary parts of so large a centre ; and yet they are sufficiently obtrusive to excite a wish that they were either removed or made larger. In a word, they do not co-operate with the main body in forming a whole ; and, though important in a useful point of view, they are worse than useless in point of either architectural or picturesque effect.

Design LXV. — *A Dwelling, with Three Rooms, and other Conveniences.*

413. *Accommodation.* The ground plan shows an entrance lobby, *a* ; kitchen and living-room, *b* ; bed-room, *c* ; back kitchen, *d* ; privy, *e* ; root-cellar or cow-house, *f* ; pigsty, poultry-house, or place for fuel, *g* ; dairy, *h* ; pantry, *i* ; and dusthole, *k*. The chamber floor contains one good room.

414. *Construction.* The walls of the main body of the building are shown of stone, the lower part of the centre has rusticated corners ; and the corners of the wings are plain. Some consequence is given to the entrance door by two projecting pieces on each side, which may be covered with one flat stone, that will thus serve both as a cap to the piers, and as a roof to the entrance.

415. *General Estimate.* Cubic contents, 13,056 feet, at 6*d.* per foot, £326 : 8*s.* ; at 4*d.*, £217 : 12*s.* ; and at 3*d.*, £163 : 4*s.*

416. *Remarks.* This dwelling is neat, and has an air of comfort. There are some faults in the ground plan, one of which is, the want of a cupboard closet in the kitchen ; but this is probably intended to be supplied by a corner cupboard and dresser. The wall enclosing the stair, considering that it is to be carried up two stories, is not of proportionate thickness, and a door should have been shown to the closet under the stairs. The terrace requires a plain parapet, which might consist of a pigeon-hole wall, terminating in a row of flower troughs of the kind delineated in fig. 198, § 222 ; and there might be piers at the corners, finished with vases, or with the square flower troughs, fig. 199, § 222.

Design LXVI. — *A Cottage Dwelling of Two Rooms, with a Smithy, Shoeing-Shed, and Three-stalled Stable.*

417. *Accommodation.* This is evidently a building for display, and therefore it may be called an ornamental smithy. It depends for beauty principally on its arcade, and its far-projecting Italian roof. The ground plan shows the walk under the arcade, *a* ; the entrance passage, *b* ; kitchen and living-room, *c* ; pantry, *d* ; bed-room, *e* ; child's bed-closet, *f* ; shoeing-shed, *g* ; forge and smith's shop, *h* ; three-stalled stable, *i* ; women's privy, *k* ; and common privy, *l*.

418. *Construction.* As this building has a great extent of walling in proportion to the number of openings, all the walls, with the exception of the piers and arches, might be built of earth, or of some other cheap adhesive material. The roof may be covered with Grecian tiles. The stable should be fitted up in the usual manner, with hay-rack, manger, &c. ; and the shoeing-shed ought to have rings in the walls for the bridles or halters of the horses being shod, to be fastened to ; but it will not require either racks or mangers, as horses should never be allowed to eat during that operation. Such a building as the present is very well calculated for being covered with an iron roof ; because the span is considerable, and the form simple. There are three kinds of iron roofs, any of which might be adopted for this building. The first is the cast-iron roof ; one kind of which, the invention of Carter of Exeter, has been already described, § 153 ; the second is the Russian roof, of wrought-iron rafters and sheet-iron plates ; and the third is the newly invented corrugated iron roof, without rafters of any kind. We shall here shortly describe the last two.

419. *Iron Roofs, as constructed in Russia.* The rafters, in the better description of houses, are for the most part of wrought iron, and of very small dimensions ; they are constructed on the same general principles of trussing as wooden rafters. In smaller houses, the rafters are of timber ; and in these houses, whether iron or wooden rafters

are used, the laths to which the plates are nailed are almost always of wood. We have, indeed, in Moscow, in 1814, seen iron rods substituted for wooden laths, and the sheets fastened to them by strong copper wire; but we do not think the practice general. The common mode of covering iron roofs in Russia is thus given in a late number of the *Repertory of Patent Inventions*, &c.:—"Sheet-iron coverings are now universally made use of on all new buildings in Petersburgh, Moscow, &c. In the case of a fire, no harm can come to a house from sparks falling on a roof of this description. The sheets of this iron covering, measure two feet four inches wide, by four feet eight inches long, and weigh twelve pounds and a half avoirdupois per sheet, or one pound five ounces each superficial square foot. When the sheets are on the roof, they measure only two feet wide by four feet in length: this is owing to the overlapping. They are first painted on both sides once; and, when fixed on the roof, a second coat is given. The common colour is red; but green paint, it is said, will stand twice the time. Small bits, or ears, are introduced into the laps, for nailing the plates to the two-inch square laths on which they are secured. It takes twelve sheets and a half to cover 100 feet, the weight of which is only 150 lbs.; the cost only £1 : 15*s.*, or about 3*d.* per foot." (*Sup. to Rep. of Pat. Inven.*, 1832, vol. xiii. p. 409.)

420. *Corrugated Iron Roofs* are composed of sheet iron, impressed so as to present a surface of semicircular ridges, with intervening furrows, lengthwise of the sheet. By this means, the sheet, from a plain flat surface having no strength but from its tenacity, becomes a series of continued arches, abutting against each other, fig. 348; and the metal, by this new position, acquires strength also from its hardness. To give an idea of the strength acquired, it is observed by Walker, the inventor of this mode of preparing sheet iron, that "a single sheet of iron, so thin that it will not continue in a perpendicular position, will, after undergoing the process of corrugation, bear upwards of 700 lbs. weight, without bending in the least degree." Iron so furrowed will be preferable to common sheet iron for covering a flat roof; because the furrows will collect the water, and convey it more rapidly to the eaves: but this is a trifling advantage, scarcely worth mentioning, in comparison with others which follow. Suppose, that, in addition to furrowing a sheet lengthways, so as to give it the appearance of fig. 349, it is also bent in one general curve in the direction of its length, so as to give it the appearance of fig. 350, we have then an arch of great strength, capable of serving as a roof, without rafters, or any description of support, except at the eaves or abutments. It is evident that, the span of any roof being given, segments of corrugated iron may be riveted together, so as to form such an arch as may be deemed proper for covering it. To every practical man, it will be further evident, that a roof of extraordinary span, say 100 feet, which could not be covered by one arch of corrugated iron without the aid of rafters, might be covered by two or three, all resting on, and tied together by, tie-rods, fig. 351. Further, that in the case of roofs of a still larger span, say 200 feet, a tie-rod might be combined with a trussed iron beam, fig. 352; by which

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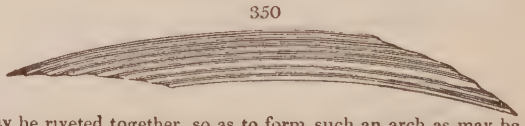

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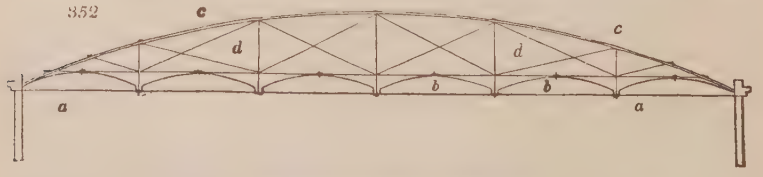

a a, Tie rods. *b b*, &c., Corrugated arches, each forty feet span. *c c*, Segment rafter of wrought iron, supporting the tie rod and the roof of corrugated arches under it, and kept steady and strong by the trussing, *d d*, &c.

roofs of this span, or even one of more than double the extent, might be covered without a single rafter appearing inside. In short, no material hitherto brought into notice at all approaches this, in its capacities for forming light and economical roofs of the greatest extent of span, and with the least loss of interior room. Its durability will depend on the application of oil or tar paints: for barns, sheep-houses, and various other country buildings, and for all manner of sheds, both in town and country, it is particularly suitable. As the invention has only been known four or five years, much has not hitherto been done with it; but there are several roofs of corrugated iron in the London Docks, and fig. 353 represents a portion of one of them. "Its length is 225

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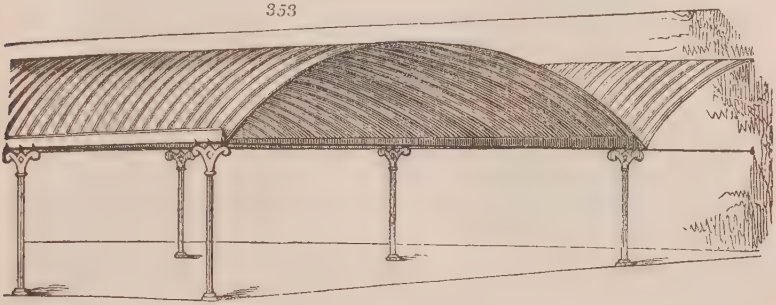
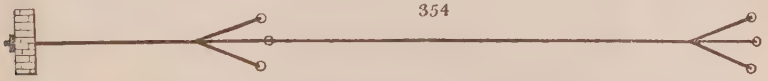


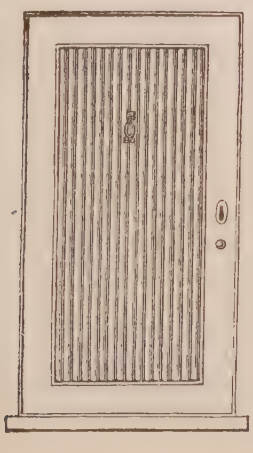
feet, its width 40 feet, and the height of the columns on which the roof is supported 12 feet. The columns are of cast iron, a gutter of which metal is continued from column to column, the whole length of the roof; and in the gutter rests the edge of the roof. The arch is formed of several sheets of iron, curved in a reverse direction to the corrugated arches, as shown fig. 353, and riveted together longitudinally. Similar arches, connected to each other by rivets, compose the roof: every corrugated arch forms a watercourse, ending in the gutters at the side, and thereby rendering it quite waterproof. To give stability to the whole, a tie rod, fig. 354, is carried across the shed

354



from each column to the one opposite. Between this shed and the brick wall is a lean-to corrugated roof, forming a half arch, springing from the gutter, and resting against the wall, as shown in fig. 353." The walls of buildings may be constructed of this iron set on edge, either in single plates, or of double plates with a vacuity between, to lessen the effect of changes in the exterior temperature on the space enclosed. As the corrugation, or fluting, of the iron may be made either large or small, it may be adapted to the panels of doors, as in figs. 355, 356, and 357; or an

355



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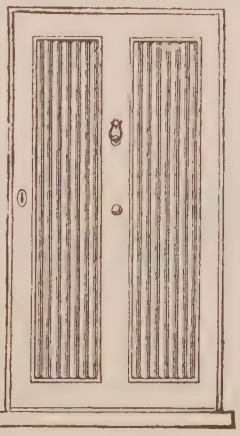

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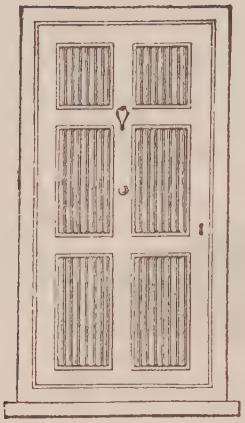

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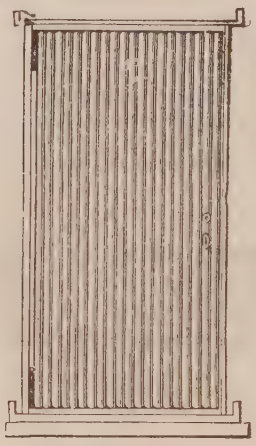
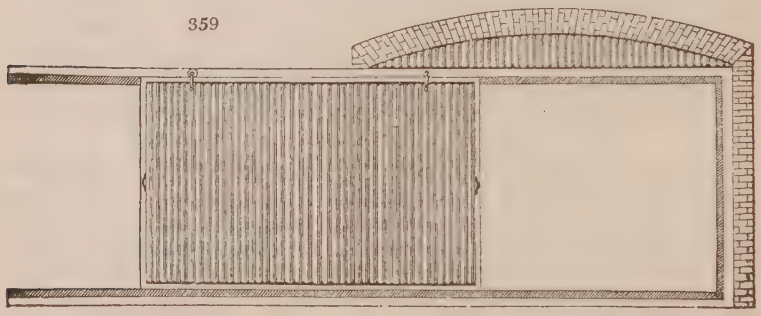


entire door, with the frame of rod iron, may be filled in, so as to serve as a substitute for a ledged door, fig. 358. The sliding gate, fig. 359, has been erected as an entrance to one of the docks. The frame is of the usual construction, of timber, and inserted in a

359



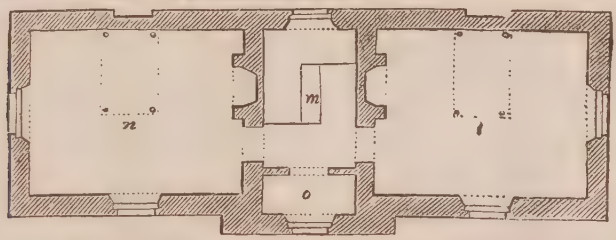
brick wall. The gate is composed of sheets of corrugated iron riveted together, so as to form one large panel, the size of the opening; the foot of this gate rests in a groove, as shown in the section, fig. 360, *b*, made of timber or stone, and embedded in the earth, so as to be level with the roadway. On the upper edge are two grooved wheels, which work on an iron ledge groove, *a*. Shutters to shops may be made of this description of sheet iron, as well as chests, and a variety of other objects which will easily occur to a practical man. The following are the prices at London in 1832: — Roofs, per square of 100 feet, £5 : 10*s.*; verandas, per square, £7; and doors of the ordinary size, in six panels, as in fig. 357, £2 : 10*s.* each. This description of roof is not particularly applicable for small-sized cottages, but may be used for large ones; and, for smithies, carpenters' shops, and all manner of sheds, it seems particularly appropriate. Portable houses might be very readily made of it for exportation; but, wherever such houses were erected, they should be covered with ivy, or some other evergreen creeper, to moderate the effect of changes in the exterior temperature.

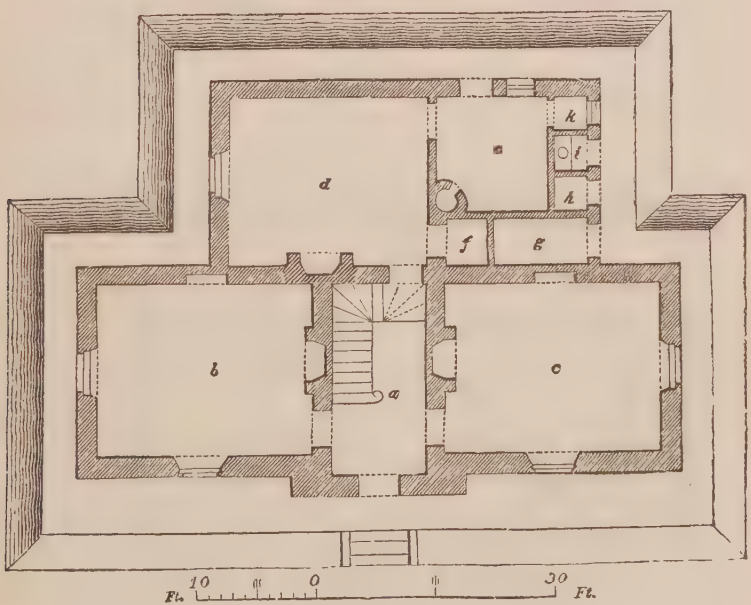
360

421. *General Estimate.* Cubic contents, 28,636 feet, at 6*d.* per foot, £715 : 18*s.*, at 4*d.*, £477 : 5*s.* : 4*d.*; and at 3*d.*, £357 : 19*s.*

422. *Remarks.* There is a simplicity and grandeur in the elevation of this Design, which by no means belongs to a common dwelling; and, were the chimney tops omitted, we should be at a loss to know its purpose. The extent of the arcade, and its width, with the small windows under it, would seem to indicate that this Design has been intended for a hot climate; but,

LXVII.





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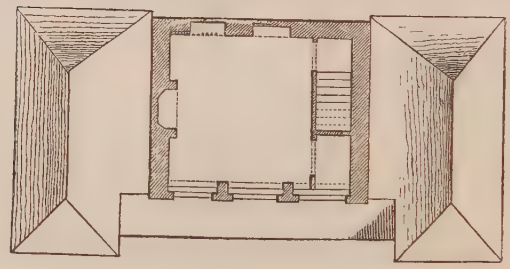
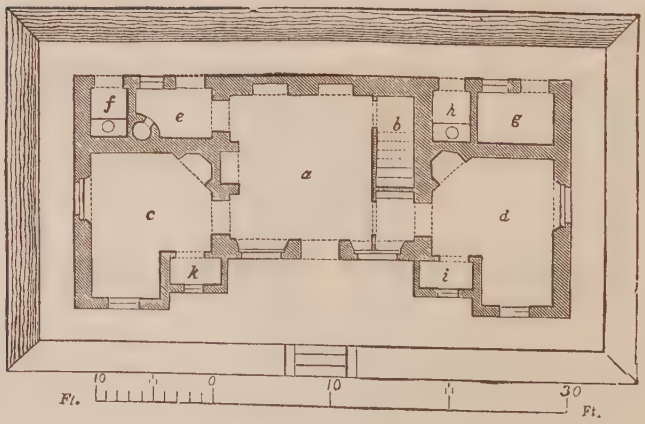
LXVIII.





for such a climate, the chimney tops are too conspicuous. They are very well calculated for Britain or North America; but, for either of these climates, there ought to have been at least one additional window to each room. In the engraving, we have shown the tiles of the roof much more distinctly than they were seen in the drawing sent by our contributor. When the covering of a roof is (like thatch, plain tiles, or slate) neither ribbed nor definitely marked, except by its great outlines, indistinctness is no defect; but a roof marked, in consequence of its construction, by distinct lines and strong shadows, should have the parts as definitely made out in the picture as in the reality. Whoever will examine the published works of the Italian Architects, or the views of Italian buildings taken by British Architects or artists, will find that much of their beauty depends on the minute details of the roof, and especially of the projections of the eaves; and of the ridge pieces, as well of the hips as of the main roof.

Design LXVII. — *A Cottage Dwelling of Five Rooms, in Two Floors.*

423. *Accommodation.* The ground plan contains an entrance lobby and staircase, *a*; parlour, *b*; another parlour, or best bed-room, *c*; kitchen, *d*; back kitchen, *e*; closet, *f*; root-cellar, *g*; dusthole, *h*; privy, *i*; and pantry, *k*. The chamber floor contains two good bed-rooms, *l* and *n*; with a dressing-closet, *o*: the well-hole of the stair is shown at *m*.

424. *Construction.* The walls are shown of such a thickness as to admit of their being built of rubble-work. The roof is covered with slates, and the guttering, which is of cast iron, is calculated to serve as a cornice to the eaves.

425. *General Estimate.* Cubic contents, 29,044 feet; at 6*d.* per foot, £726 : 1*s.*; at 4*d.*, £484 : 1*s.* : 4*d.*; and at 3*d.*, £363 : 0*s.* : 6*d.*

426. *Remarks.* The chief merit of this building is, that it contains five good-sized rooms; for size is very desirable, both in a cold climate and a warm one. Air in large bodies is much more slowly either heated or cooled by the mere contact of hot or cold air, and it is also less liable to be traversed by currents of air, than when in a smaller volume. No one could sit in a small room with doors and windows on all sides, without experiencing what is commonly called a draught; but, in a very large room, doors and windows on all sides will occasion no such inconvenience. We object to the position of the recesses for cupboard closets in *b* and *c*; because they occupy the proper places for a sofa in the one room, and for a bookcase in the other: they also seem to divide the side of the room into two parts, and thus take away from the idea of a whole. If these rooms were to be handsomely finished, the doors in question would be highly objectionable, on the latter account. The closets in question ought to have been placed, one in both *b* and *c* exactly opposite the entrance door; and another, in each room, between the fireplaces and the side walls in which they are now placed. So large a dwelling, we think, ought to have had a porch; but that may be matter of economy on the part of the proprietor. There is a poverty about the elevation, which requires to be removed by architraves to all the windows, by sills to those of the chamber story; and by other means, which are by this time become familiar to our readers. We need not say that we object to the truncated pediments, which give a tame lumpish character to this dwelling, hardly in accordance with the bold and handsome chimney tops.

Design LXVIII. — *A Dwelling of Four Rooms, with other Conveniences.*

427. *Accommodation.* The door is protected by a far-projecting roof, and enters at once into the kitchen and living-room, *a*, in which is a staircase to the bed-chamber, with a closet under it, *b*: from this we have a room with a bed in a recess, *c*; and another of the same description, *d*: there are a back kitchen, *e*; privy, *f*; root-cellar and fuel place, *g*; and dusthole, *h*. There is a good bed-closet in the chamber story; and on the ground floor there is another closet, *k*, which may serve as a pantry, and a third, *i*, which may be used as an office, or place for books, &c., according to the occupation of the inhabitant.

428. *Construction.* The walls may be of brick, hollow, and the roof slated; but the building would have the best effect, if the walls were covered with cement or plaster, and coloured of a mellow tint. We say they would have the best effect; because the beauty of this dwelling depends on the contrast between its perpendicular and horizontal lines; and between its bright lights and dark shadows: and both lines and shadows are more conspicuous in light-coloured walls than in any other.

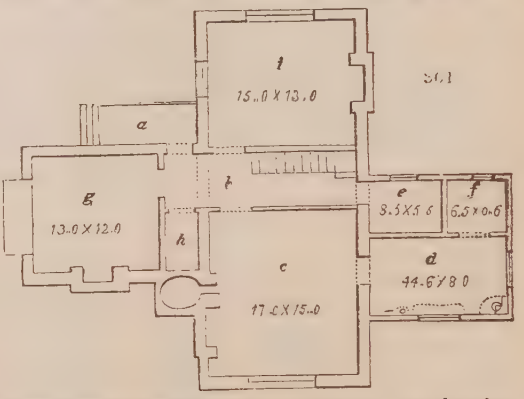
429. *General Estimate.* Cubic contents, 11 890 feet, at 6*d.* per foot, £297 : 5*s.*; at 4*d.*, £198 : 3*s.* : 4*d.*; and 3*d.*, £143 : 12*s.* : 6*d.*

430. *Remarks.* There is something pleasing in the contrast of the lines, and of the lights and shadows, in this dwelling; but it has not much of the expression of a cottage.

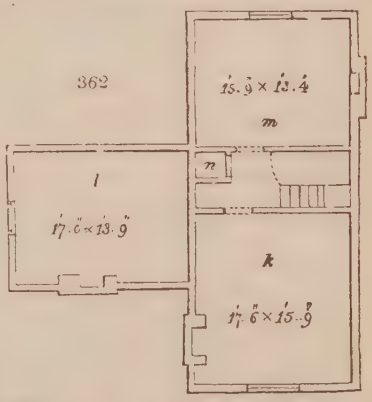
It seems better calculated for a small public-house, or coffee-house, to be placed on an eminence, commanding a fine prospect, or close by a river. The room *a* might then be the kitchen, and public sitting-room for guests, and there might be a good cellar under it; *d* and *c* might also be for guests, the bed recesses being concealed by folding-doors; and the room up stairs might be considered the principal room, as it would have the best prospect. The expression of the Design is somewhat Italian, but it wants the characteristic tiles. It will never be erected where economy in the construction is an object.

Design LXIX. — *A Cottage Dwelling, in the Old English Style, with Kitchen, Parlour Business Room, Three Bed-chambers, and other Conveniences.*

431. *Accommodation.* The ground plan, fig. 361, to a scale of 20 feet to an inch, contains a porch, *a*; a lobby and passage, with staircase, *b*; a kitchen, *c*; a wash-house, *d*, with boiler, washing-trough, and sink; a store-room, *e*; pantry, *f*; business room, *g*; closet, *h*; and parlour, *i*. The chamber floor, fig. 362, contains three bed-rooms, *k*, *l*, and *m*; and a closet, *n*. The other requisite conveniences are supposed to be placed in the garden.



432. *Construction.* The walls may be of brick, or of rubble-work, with corners of squared stone. The roof is supposed to be covered with plain tiles, having barge boards against the west gable, as shown in the elevation, fig. 363; and also against the east gable, as shown in the elevation, fig. 364; and with the two other gables truncated, as may be seen in the south elevation, figs. 365 and 363, and in the perspective view, Design LXIX., p. 215. There are Gothic labels over the kitchen and parlour windows; and the window of the business room projects in the manner of an oriel, as may be seen in figs. 363 and 365. Perhaps it may be thought by some of our readers, that the chimney tops in this Design, and in a number of others, are carried too high; that is, higher than can be of any use, either in creating a draught for the smoke, or in rendering the dwelling more ornamental. Now we are prepared to give our reasons for denying these suppositions. In the first place, it is known and acknowledged, both in theory and practice, that the simplest and most effectual mode of producing a draught in a flue, so as to cure a smoky chimney, is, to add to its top a long narrow funnel. This funnel is, in all ordinary cases, an earthenware cylinder of eight or ten inches in diameter, and between two and three feet long: but, in difficult cases, the length is increased to five feet, by employing a longer earthenware tube; or to a still greater length, by employing those tubes of copper or iron called about London "tall boys." The five feet long chimney pots are made by joining two pots of the ordinary length together before they are burnt: but, as these long pots are liable to be broken in the kiln, the cost of them about London, in 1832, is 9*s.* each by retail; therefore two or more draining tubes, such as are shown in fig. 411, which cost 2*s.* each, are preferable. In the second place, with respect to ornament, our object is, by clothing these tubes, whatever may be their length, with architectural forms, instead of leaving them bare as is almost universally done, to render them handsome component parts of the building, instead of deformed appendages to it.

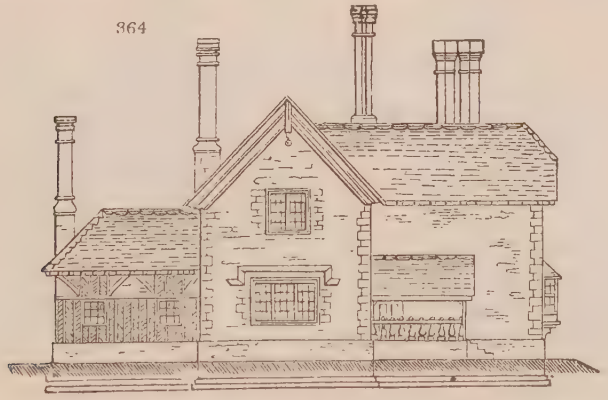


363

433. *General Estimate.* Cubic contents, 21,660 feet, at 6*d.* per foot, £541 : 10*s.*; at 4*d.*, £361; and at 3*d.*, £270 : 15*s.*

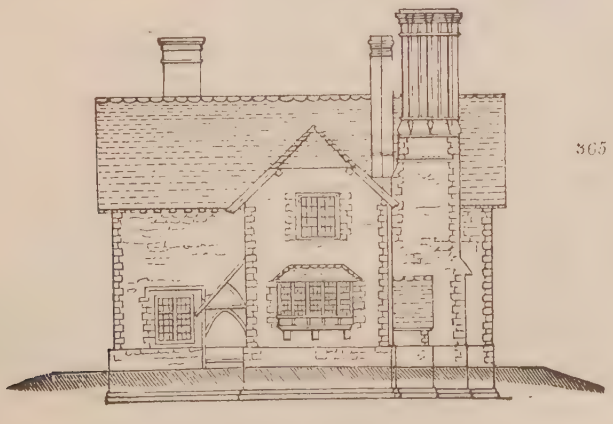
434. *Remarks.* No one can mistake the expression of this Design, who has ever seen an English cottage. It pretends to be nothing more than what it is, and might be

364



mistaken for a copy from nature. It seems to us to want dignity, which might be given by heightening the windows of the parlour-floor, and by a surrounding terrace. The ground plan is very convenient.

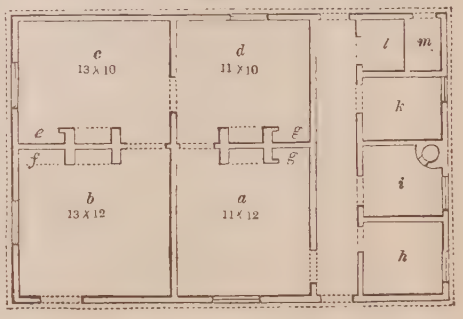
365



Design LXX. — *A Cottage Dwelling of Four Rooms, with other Conveniences.*

435. *Accommodation.* The ground plan, fig. 366, shows a kitchen, *a*; parlour, *b*; best bed-room, *c*; bed-room, *d*; closet, *e*; recess for books, *f*; two closets, *g g*; pantry, *h*; wash-house, *i*; potato cellar, and place for lumber, *k*; coal-house, *l*; and privy, *m*.

366



436. *Construction.* The walls, which have brick footings to the height of eighteen inches above the surface, are of stud-work, covered with weather-boarding without, and lath and plaster within; the floors of *a*, *b*, *c*, and *d*, are of boards, and those of the passage and offices of tiles and bricks. The roof is covered with pantiles; it is in two parts, the higher and wider part being over the living-rooms, and the low narrow division covering the passage and the offices. There is a rustic veranda along one front, constructed of barked oak branches, on which vines and flowering shrubs are twined.

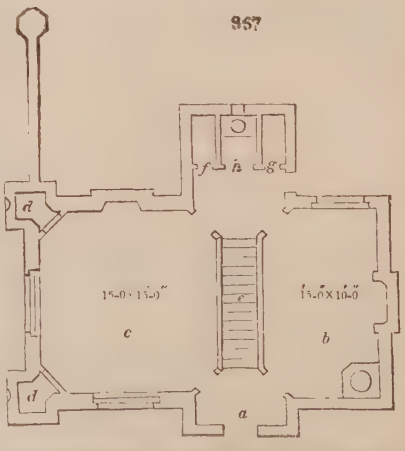
437. *General Estimate.* Cubic contents, 11,040 feet, at 6*d.* per foot, £276; at 4*d.* £184; and at 3*d.*, £133.

438. *Remarks.* This Design is executed at Chingford in Essex, and it has been sent us as being very economical in the erection, and very commodious and convenient in the occupation. We have improved the forms, and increased the height, of the chimneys, for the sake of effect, and also in order to make them draw better. Without high, bold, and carefully studied chimney tops, a cottage, to us, is without one of its chief beauties; and it is, besides, very liable to smoke. Beauty, in this case, as in most others, goes hand in hand with utility. We by no means approve of the plan of having the outside walls of a cottage of wood; but, in many cases, it cannot be avoided. When an old cottage, with walls of this description, is to be improved, the weather-boarding may be covered either with what is called weather-tiling, of which we shall give a variety of shapes in a succeeding page, or with tiling so marked as, when put up, to resemble bricks, and known as brick weather-tiling, of which we shall also hereafter give specimens. Much of the effect of such a cottage will depend on the disposition of the flowering shrubs and trees on its veranda and trellised porch.

Design LXXI. — *A Castellated Lodge, as a Dwelling for a Gardener, or other upper Servant, on a Gentleman's Estate.*

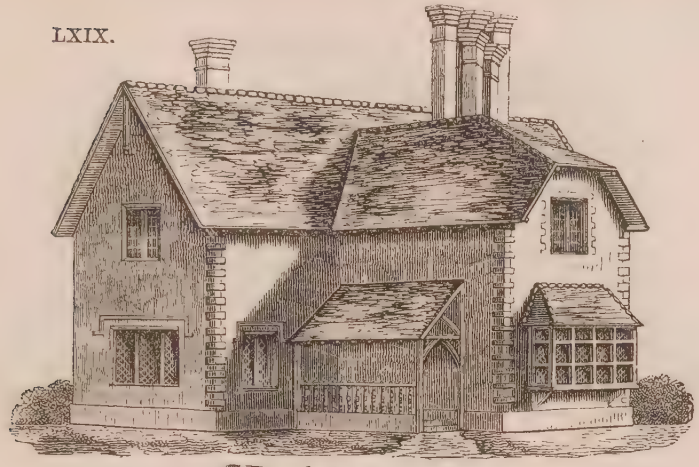
439. *Accommodation.* The ground plan, fig. 367, shows a porch, *a*; kitchen, *b*; living-room, *c*; two light closets, *d d*; staircase, with closet under, *e*; place for coals, *f*; for wood, *g*; and water-closet, *h*. The chamber floor, fig. 368, contains two good bed-rooms, *i*, *k*; and two bed-closets, *l*, *m*.

367



440. *Construction.* The contributors of this Design, Messrs. W. and H. Laxton, have sent the following details. Fig. 369 is a section across the window in the living-room, in which is shown the wall of brick, *a*; label moulding over the window, *b*; reveal, with splay, finished with cement, *c*; frame to the casements, four inches by two inches, with hollow worked on the edge, rebated, and beaded, *d*; inch and half Gothic bar casement, rebated on the lower edge, to shut against an iron tongue, let into an oak sill, *e*; lintel, four inches and a half by three inches and a half, *f*; plate, four inches and a half by five inches, *g*; joists, seven inches by two inches and a half, notched on to the plate, *h*; ceiling, *i*;

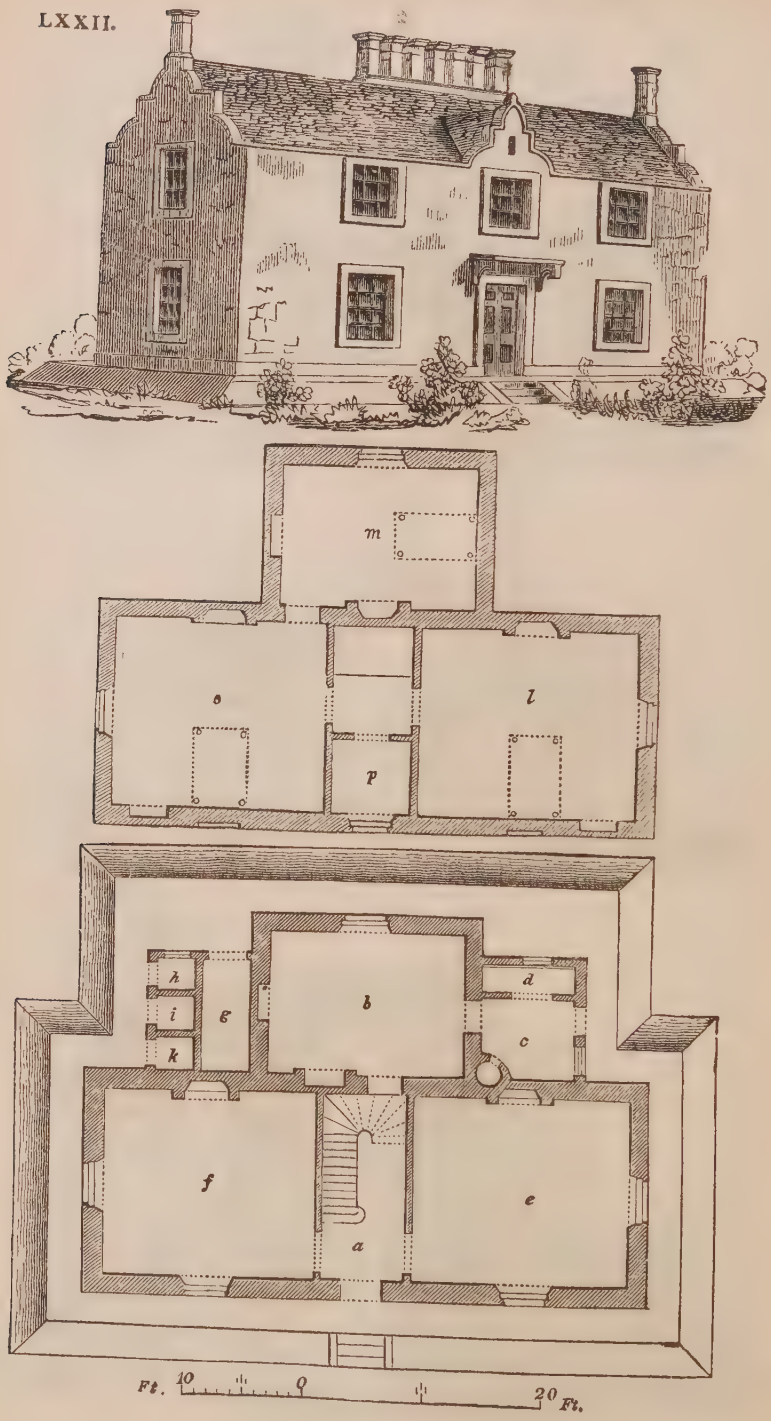
LXIX.

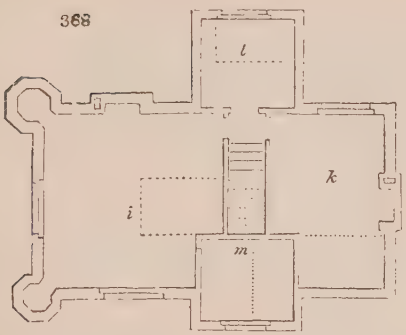


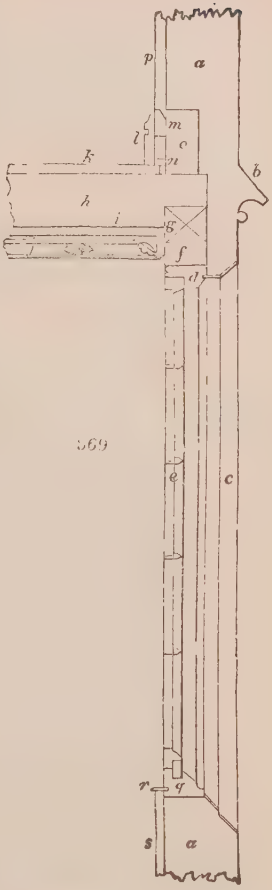
LXX.

LXXI.

LXXII.



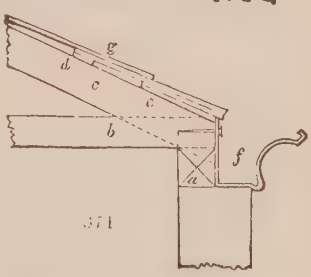




369

cornice, with flowers or bosses, fifteen inches apart, *j*; floor boards out of two cut battens, *k*; skirting board, with hollow worked on the edge and a groove, *l*; narrow ground, splayed for plaster, *m*; small fillet nailed on the floor, for fastening the skirting, *n*; wooden brick, four inches by two inches and a half, *o*; plaster, *p*; oak sill, *q*; capping, or window board, *r*; and window back, *s*. Fig. 370 is a section showing the construction of the embattlements, in which we have the wall of the ground floor a brick and a half thick, *t*; the wall of the bed-room floor one brick thick, *u*; the coping of the embattlements formed of Austin's artificial stone, *v v*; and the moulded string under the embattlements, *w*. Fig. 371 is a section, showing the gutter and the roof, in which the wall-plate is represented at *a*; the ceiling joist, four inches by one inch and a half, is nailed to the side of the rafter at *b*; the rafter, *c*, four inches by two inches, is notched on to the wall-plate; the battens for the slates, three inches by three quarters of an inch, are shown at *d*; three quarters of an inch feather-edged eavesboard at *e*; a cast-iron gutter at *f*, moulded to form a cornice, and fastened by copper nails to the ends of the rafters; and slates at *g*. Fig. 372 is an elevation of the south-east end of this building. Fig. 373 is an elevation, to a scale of three eighths of an inch to a foot, of the chimney tops, formed of Austin's artificial stone.

370



371

441. *Specification and Estimate.* As the building is small and simple, these are combined in what is technically called one particular. The prices are calculated at the prime cost of materials and labour, in London, in the year 1832.

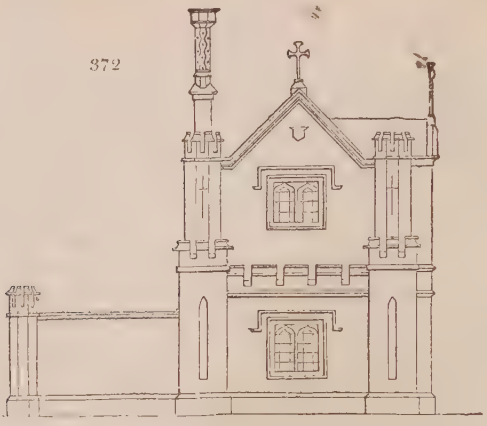
442. *Digger and Bricklayer's Work.*

	£	s.	d.
Twenty cubic yards, digging, wheeling, or filling in to the foundations, and over the whole surface, six inches deep	1	0	0
Seven rods and three quarters reduced stock brickwork, at £12 per rod	93	0	0

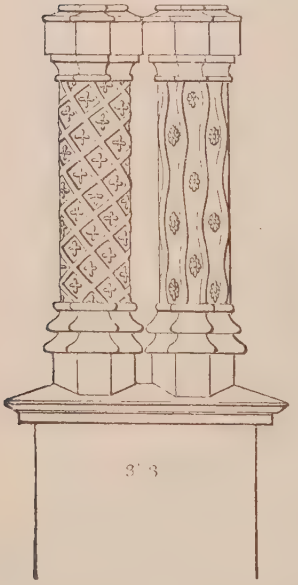
The walls are to have two courses of one brick in thickness, and the plinth is to be half a brick thicker than the walls above, as shown in the ground plan, fig. 367. There are to be one-brick footings,

£ s. d.

372



eighteen inches high, to the partitions forming the sides of the stairs and lobby; and one-brick sleeper walls, for the joists under the parlour. (A sleeper is a piece of scantling, laid on the top of a low wall, under the flooring, on which the joists are to rest.)



3′ 3

Thirty yards of brick nogging of stocks laid flat to the partitions on the ground floor, at 3*s.* a yard ..... 4 : 10 : 0

Five yards of brick paving of stocks, laid flat in sand, to the closet for coals, under the stairs, at 2*s.* 3*d.* per yard ..... 0 : 11 : 3

Forty-five feet superficial of cuttings to the rakes of the gables at 3*d.* per foot ..... 0 : 11 : 3

Ten feet superficial of two courses of plain tiles, bedded in cement, and rendered on the top, to the flat roofs of the towers ..... 0 : 7 : 6

Two hundred and two feet lineal of cuttings to the splays of the windows and doors, at 2*d.* a foot (*c*, in fig. 369) ..... 1 : 13 : 8

Cutting four small Gothic heads, and one large ditto; and four loophole crosses to the towers 0 : 10 : 0

One hundred and sixteen feet lineal of brick on edge, cut and set in cement, for plinth, 2½*d.* per foot (fig. 374)..... ..... 1 : 4 : 2

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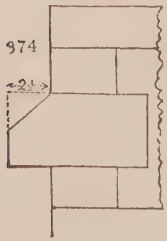


375

	£	s.	d.
One hundred and sixty feet lineal bird's-mouth splays to the quoins (corners) of the towers, at 2*d.* per foot. (A bird's-mouth splay is an oblique angle, as at *a*, fig. 375, instead of a right angle.).....	1	6	8
To build a small cess-pool, two feet six inches square, and one foot six inches deep, of one brick wall all round, under the water-closet; and to provide thirty feet of eight-inch drain pipes, and digging, to convey the soil to the common sewer; also an earthenware pan and trap.....	2	18	0
	£107	2	6

443. *Slater's Work.*

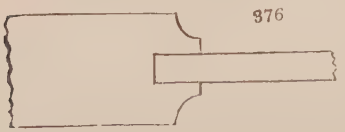
Eight square forty feet of countess slating, at 25*s.* per square.....	10	10	0
Thirty-six feet lineal of glazed ridge tiles, at 6*d.* per foot.....	0	18	0
Eighty-six feet lineal of cement filleting to the gable, at 2*d.* per foot	0	14	4
	£12	2	4

444. *Carpenter's Work.*

Seven squares of three quarters of an inch battening, two inches and a half wide, for slating, at 10*s.* per square.....	3	10	0
Sixty-three feet superficial of three quarters of an inch feather-edged eaves-board, at 5*d.* per foot	1	6	3
Eighty-six feet lineal of tilting fillets to the gables, at 1½*d.* per foot	0	10	9
Two hundred and ninety-eight cubic feet of Memel, Riga, or Dantzic fir, in bonds, plates, rafters, joists, and quarters, as under, at 3*s.* 6*d.* per foot.....	52	3	0
Ridge-pieces, ten inches by one inch and a half; rafters, four inches by two inches and a half; purlins, four inches by four inches; two collar beams, nine inches by three inches; ceiling joists halved on to the rafter, four inches and a half by one inch and a half; (joists are said to be halved on, when they are joined by half being cut out of the joist and half out of the rafter); a girder under the floor of the large room, nine inches by nine inches; joists, seven inches by two inches and a half; plates, four inches by four inches and a half under the roof, and under each floor, all round, except where the flues intervene; also two tiers of bond, four inches by two inches and a half; oak sleeper under the ground floor, and oak sill, four inches by four inches, to the partition on the ground floor; heads to the partition, four inches by five inches, to form the sill of the partition above, or the cross-tie to the roof; centre and door-posts, and door-head, four inches by four inches; quartering, four inches by two inches; door-posts and head to the water-closet, and the closets on each side, four inches by four inches, to be wrought all round; beaded head to the partition over ditto, four inches by four inches; puncheons, four inches by two inches.			
Three centres to the fireplaces, and ten ditto to the apertures of the doors and windows; one centre to the Gothic head	1	0	0
	£58	10	0

445. *Joiner's Work.*

Nine and a quarter square inch deal wrought folding floors, at 40*s.* per square.....	18	10	0
Two hundred and thirty feet, lineal plain skirting out of two cut battens, with a hollow and groove worked on the face, backings, and wooden bricks at 6*d.* per foot (see *l*, and *o*, in fig. 369).....	5	15	0
Eight one and a half inch four-panel square framed doors, six feet six inches by two feet six inches, with a hollow worked on the framing round the panels, as in fig. 376, hung with three-inch butt hinges, and fastened with a six-inch iron-rimmed two-bolt lock, one and a half inch rebated linings and mouldings round both sides, at 30*s.* per door.....	12	0	0


376

Four doors as above, with fillets nailed on the door-posts to form stops, to the water-closet, to the closets on each side, and to the

	£	s.	d.
closet under the stairs; each door hung with three-inch butt hinges, and having a four-inch lock to each, at 22*s.* per door.....	4	8	0
Four one and a quarter inch framed and beaded closet fronts, eight feet by three feet three inches, with four-panel square doors, hung with three-inch butt hinges, and having a moulding round, and a closet lock to each, at 26*s.* per door.....	5	4	0
A two-inch two-panel bead butt and square framed door, seven feet by three feet, with one and a half inch sash and shutter; the lower panels to be filled in with a Gothic moulding, and Gothic head, hung with four-inch butt hinges, and fastened with a nine-inch drawback lock, and two eight-inch bolts. A proper door-case of fir, four inches by four inches, with a moulding round inside.....	3	3	0
One and a half inch sash door to the back lobby, six feet six inches by two feet six inches, framed bead butt and square; with a shutter, and a pair of three-inch butt hinges, a thumb-latch, two bolts, a thumb-screw, and two stubbs; a proper doorcase of fir, four inches by three inches, with a moulding round inside.....	2	0	0
Eighty feet superficial of one and a half inch square framed partition, to divide the small room, on the bed-chamber floor, from the stairs; also over the stairs, with a four-panel square framed door in ditto, at 9*d.* per foot; sixteen feet of moulding round ditto; one pair of three-inch butt hinges, and a six-inch two-bolt lock.....	3	7	0
Four windows with one and a half inch deal casements, Gothic heads and spandril, four feet six inches by five feet in the clear; hung folding (both casements to open and shut against each other as in fig. 177 § 196,) with three-inch butt hinges, and fastened with two five-inch brass flush bolts, and a brass fastening; two-inch deal rebated and beaded frame, four inches wide, with hollow worked on the outer edge (*d*, in fig. 369), and with oak sills, at £2: 2*s.* each.....	8	8	0
Four windows, three feet six inches by five feet, at £1: 18*s.* per window.....	7	12	0
Two pair of one and a half inch deal shutters, framed as doors, to the parlour windows, hung as sashes, with pulleys and boxings complete, each twenty-eight feet superficial, and with four feet extra-length of boxing, two brass flush rings, a brass thumbscrew, and two four-inch brass flush bolts to each window.....	4	0	0
A three-quarter-inch ledged shutter to the kitchen window, seventeen feet six inches superficial, with a wooden bar, and two staples.....	0	15	0
Fourteen feet superficial one and a quarter inch deal seat, riser and bearer to the water-closet; five feet superficial one and a quarter inch deal clamped flap, and beaded frame; six feet lineal inch skirting, four and a half inches wide, one pair of two-inch brass butt hinges, and two holes cut; and a small bull's-eye light frame and linings.....	1	13	0
Sixty-five feet superficial of one and a quarter inch deal steps, with inch risers, bracketed and housed into one inch and a half wall string, twenty-five feet superficial, with thirty feet lineal of beaded capping; and a deal moulded rail, fifteen feet lineal, fastened with three iron brackets.....	6	5	0
Deal dresser, seven feet long by two feet wide, with three drawers under, pot board and bearers; three-inch deal shelves over, and two cut standards (the upright piece of deal to which the ends of the shelves are fixed).....	3	0	0
One hundred feet of inch deal, wrought on both sides, to be fixed with bearers for shelves, at 8*d.* per foot.....	3	6	8
	£89	6	8

446. *Stonemason's Work.*

Two profile stone moulded chimney-pieces, with slabs and back hearths, to the parlour and the room over; opening three feet high, by two feet eight inches wide.....	3	10	0
A set of stone jambs and mantle, five inches wide, to the bed-room, with slab and hearth.....	0	15	0

	£	s.	d.
A set of one and a half inch stone ditto, eight inches wide to the kitchen, with slab and back hearth	1	5	0
A six-inch stone sink, ten feet superficial, with a trap in ditto pinned into the wall on two sides	2	5	0
Two stone steps, seven feet lineal, to the doorway	1	1	0
	£8	16	0

447. *Plasterer's Work.*

One hundred and thirty-six yards of whiting ceilings, at 1*d.* per yard	0	11	4
Two hundred and fifty-six yards of colouring walls, at 2*d.* per yard	2	2	8
One hundred and fifty yards of render and set, at 7*d.* per yard	4	7	6
Fifty-nine yards floated ditto, at 10*d.*	2	9	2
One hundred and eighty-seven yards of lath, plaster, and set, to the partition and ceilings, at 1*s.* : 5*d.*	13	4	11
Thirty yards floated ditto, to the parlour, at 1*s.* : 9*d.*	2	12	0
Forty-five feet lineal of cornice, six inches in girth, at 5*d.* per foot (see *s*, in fig. 369)	0	18	9
Fifty-eight feet lineal moulded coping in cement to the gables, and eighty-one feet ditto to the embattlements (see *v v*, in fig. 370), at 1*s.* : 6*d.* per foot	10	8	6
Thirty-seven feet ditto label mouldings to the windows (see *b*, in fig. 369), at 6*d.* per foot	0	18	6
One hundred and fifteen ditto ditto string mouldings (see *w*, in fig. 370), at 9*d.* per foot	4	6	3
Sixteen mitres to the gable moulding, at 3*d.* each	0	4	0
Three shields, at 1*s.* each	0	3	0
Four ornamental chimney tops of Austin's artificial stone, five feet high, at £2 : 2*s.* each (see fig. 373)	8	8	0
	£50	14	7

448. *Plumber, Painter, and Glazier's Work.*

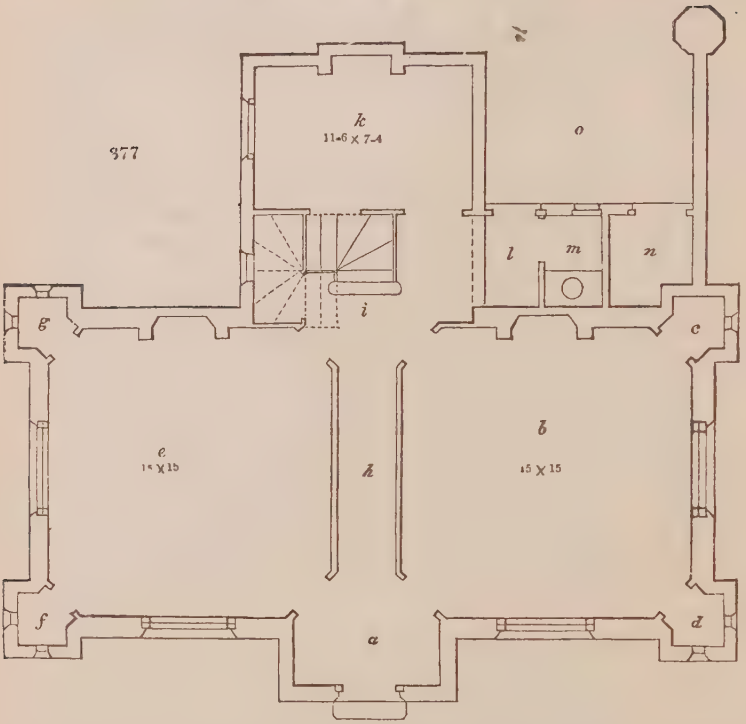
Three cwt. of milled lead to the valleys, at 25*s.* per cwt.	3	15	0
Ten feet of three-quarter-inch pipe, with joints and stopcock to ditto, for the water-closet	1	0	0
Water-butt and stand	1	10	0
Fifty-three feet lineal of cast-iron gutter to the eaves, painted four times in oil, at 2*s.* per foot (see *f*, in fig. 371)	5	6	0
Thirty-six feet ditto of two-inch iron pipe, at 1*s.*	1	16	0
Two heads and two shoes to ditto	0	12	0
One hundred and forty-eight feet superficial crown glass (third quality) to all the sashes and doors, at 1*s.* : 6*d.* per foot	11	2	0
One hundred and twenty-five yards, painted four times in oil colours, at 8*d.* per yard	4	3	4
Two hundred and thirty feet lineal of skirting ditto, at 1*d.* per foot	0	19	2
Eight casements and frames, painted on both sides	1	0	0
	£31	3	6

449. *Summary of Estimates.*

Digger and bricklayer	107	2	6
Slater	12	2	4
Carpenter	58	10	0
Joiner and Ironmonger	89	6	8
Stonemason	8	16	0
Plasterer	50	14	7
Plumber, Glazier, and Painter	31	3	6
Total prime cost of this dwelling	£357	15	7

450. *General Estimate.* Cubic contents 17,688 feet, at 6*d.* per foot, £442 : 4*s.*; at 4*d.*, £294 : 16*s.*; and at 3*d.*, £221 : 2*s.*; by which it appears that 4½*d.* per foot is about a fair price for estimating lodges of this description.

451. *Remarks.* For an ornamental cottage this must be considered a very economical plan: its accommodations are insufficient for a small farmer, or a retired tradesman; but it would not be difficult to enlarge it, and yet preserve the general character of the elevation. The contributors of this Design (Messrs. W. and H. Laxton) have sent us a plan for this purpose, fig. 377; in which *a* is the entrance lobby; *b*, the parlour, or



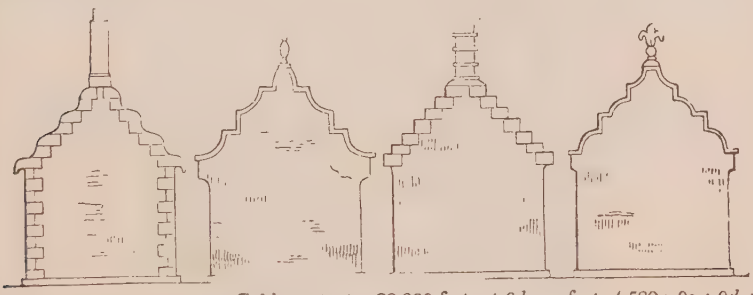
living-room, with a wine closet, *c*, and a store-room, *d*; *e*, the principal room, with a china closet, *f*, and book closet, *g*; *h*, the passage leading to a staircase, with a light pantry under it, *i*; *k*, the kitchen; *l*, the lobby to the back entrance; *m*, the water-closet; *n*, a coal and wood-house; and *o*, the yard. We object to this plan, and also to that of the original Design, fig. 367, on account of the chimneys being placed in the outside walls; but this evil may be mitigated by an increased thickness, and by forming a vacuity all round the chimney and flue, so as to lessen the conducting power of the wall. Whoever, in a climate where fires are necessary one half the year, employs an Architect to design a dwelling, whatever may be its rank, from the cottage to the palace, ought to make it an indispensable condition, to have no chimneys in the outside walls; and none that shall not draw well. Every person looking through this work, with a view to make choice of a design, ought to bear in mind the same principle. With respect to the elevation, as shown in Design LXXI., p. 215, we cannot approve of carrying through, between the lower and the upper windows, the forms of battlements, as shown in the section fig. 370, in the manner of a string course; because such an ornament has neither the appearance nor the reality of use. A string course, or horizontal band, has the architectural expression (to speak technically) of binding and tying together the work below it, as well as, to a certain extent, of protecting it from the rain. It is true that the battlement forms, carried through, as in fig. 370, will also protect what is below from the rain; but they have not that expression, for every one knows that their usual purpose, on a building, is to form the termination of a wall. The effect of these battlements on the outline elevation, fig. 372, can hardly fail to deceive the unpractised eye; and, by raising the idea that the basement story of the building projects outwards, considerably beyond the upper story, creates a beauty in the design, as seen in an outline elevation on paper, which it could never have in reality. The shaded perspective view, Design LXXI., p. 215, may be referred to in proof of this assertion, as showing the advantages of such views in conveying correct ideas of the effect of architectural designs. We may further observe that it would be an improvement, to raise the angular towers two or three feet higher, so as to detach their summits more distinctly from the gable ends. The effect of this, as of all distinctness and bold relief in buildings, is to make the parts appear more decidedly what they are; in short, to add to the strength of their expression.

Design LXXII. — *A Dwelling of Six Rooms, with various Conveniences.*

452. *Accommodation.* From the entrance and staircase, *a*, there is a kitchen, *b*; with back kitchen, *c*; and pantry, *d*: there are two good parlours, *e* and *f*; a cellar, *g*; which, if thought necessary, might be connected with the kitchen; a place for fuel, *h*; dusthole, *i*; and privy, *k*. The chamber floor contains three good bed-rooms, *l*, *m*, and *o*; and a light closet, *p*.

453. *Construction.* The walls are supposed to be rubble-stone; the roof covered with slate; and the chimney tops, coping of the side walls, and tabling of the gable ends of tooled stone. The doors and windows have plain stone facings. The guttering is formed as in fig. 120.

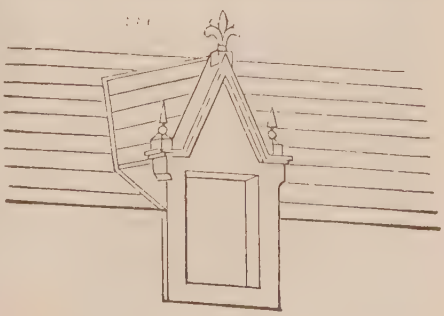
378 379 380 381



454. *General Estimate.* Cubic contents, 22,839 feet, at 6*d.* per foot, £520 : 9*s.* : 9*d.*; at 4*d.*, £380 : 6*s* : 6*d.*; and at 3*d.*, £285 : 4*s.* : $10\frac{1}{2}d.$

382 383 384 385

455. *Remarks.* This building will be known at once to be in the Scotch style. This style, which is also common in the north of France and in Flanders, prevails in all those parts of Scotland where freestone is abundant; varying sometimes with plain tabling; with the tabling stones raised one above another like the steps of a stair, as in Design XI.; or in various other forms, as in figs. 378 to 385. As the chief characteristic beauty of this manner of building depends on the gables, we have given these different forms, which the reader may vary at pleasure. The next characteristic is the storm-head windows, fig. 386; and these admit of as great a variety as the gable ends. A third distinction of this style is the facings to the doors and windows, which may also be considerably varied. The chimney tops are generally very simple. Loopholes



and very small gable windows are frequently introduced, partly to give character, but chiefly for ventilation; and these also may be considerably varied. It is remarkable that houses in this style, which is evidently one attended with considerable expense in stone-cutting, are seldom found with a porch; though this appendage, in a climate like that of Scotland, would be of the most essential service in point of comfort: a porch in Scotland, however, is seldom seen to any building under the rank of a villa. The Design before us is given more as a specimen of the Scotch style, than as a model; though it is certainly commodious, and convenient in its arrangement. It would be much improved by a string course under the chamber-floor windows, and by squared stones at the corners. A better effect would have been produced in the elevation, as well as more heat in the interior, by having the fireplaces of the two living-rooms, *e* and *f*, against the partitions which separate them from the stair. These alterations made, and a porch added, the result would be fig. 387, which may be described as a specimen of the improved Scotch style of

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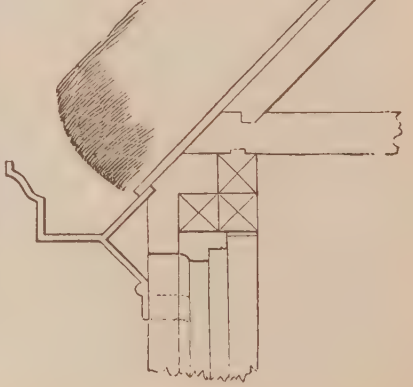
tradesmen's houses. In this figure, the vertical and horizontal bond, both in regularly hewn stone, and the panels filled up with rubble-work on the cementitious principle, will be distinctly observed. Expression is by these means given to a mere wall, as such, without reference to what it has to support or enclose. The young architectural reader ought constantly to bear in mind, not only that every building ought to have its appropriate expression obvious at first glance, but that every separate part of a building ought to have its separate expression. The student ought, therefore, to exercise himself in endeavouring to analyse every edifice that comes before him, so as to be able to feel the force of every effect, and to refer it to its cause. Two of the windows of the original Design, p. 216, are false; which, in buildings of this class, is to us an abomination.

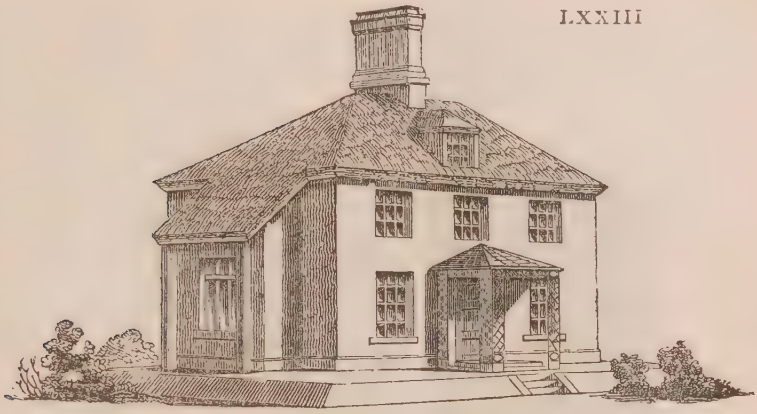
Design LXXIII. — *A Dwelling, Three Stories high, with Four Rooms, and various Conveniences.*

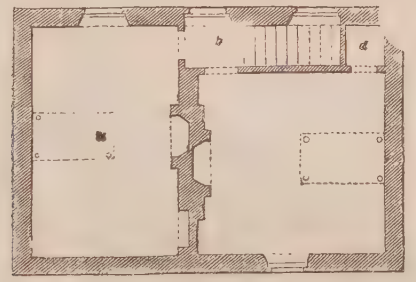
456. *Accommodation.* From a porch, *a*, the door enters into a lobby, *b*; whence there is a closet, *c*, under the staircase; there are a kitchen, *d*; back kitchen, *e*; pantry, *f*; parlour, *g*; closet cupboard, *h*; root-cellar, *i*; place for fuel, *k*; dusthole, *l*; and privy, *m*. The chamber floor contains two good bed-rooms, *n* and *o*; with a closet, *p*; and a landing to the stairs, *q*. The garret, which is entered by a trapdoor from this landing, is in one large room, lighted by a dormer window.

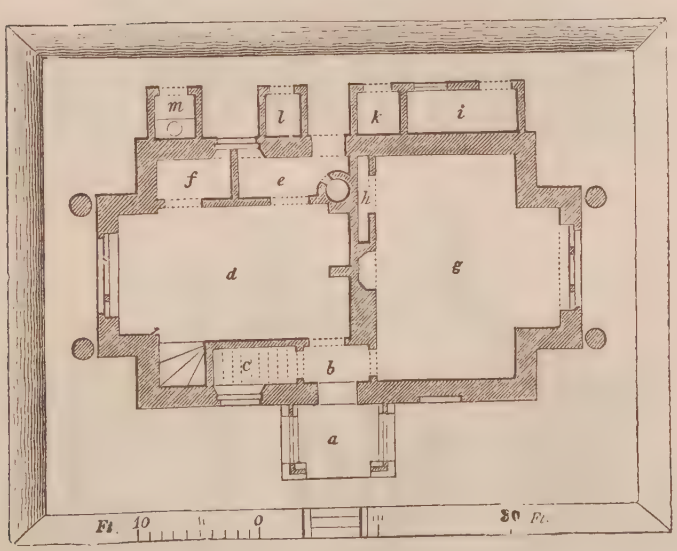


457. *Construction and Remarks.* The walls may be of rammed earth, of mud, or of rubble-stone; with the exception of the partitions, and the walls to *i*, *k*, *l*, and *m*, which may be of clay nogging. Near London, and in other situations where labour is high, walls of brick on edge, hollow, in Dearn's manner, § 386, would be equally cheap, and preferable on account of their neatness and durability. The roof is shown thatched, and without guttering, which, however, may be added; in which case it should be of wood or of cast iron, with an exterior moulding, as in fig. 388. In

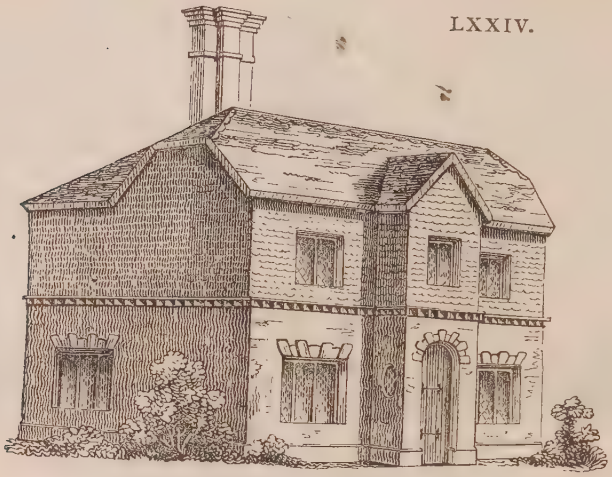
LXXIII





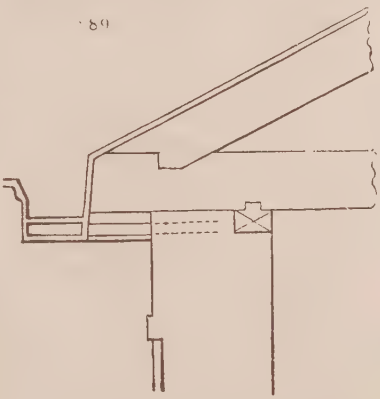


LXXIV.



LXXVI.

genera, however, thatched roofs should either project so far as to protect the wall and windows, and also a space of two feet broad, to serve as a passage, and thus render a gutter unnecessary; or, they should have two or three feet at the eaves tiled or slated, in which latter case a much cheaper and neater form of guttering may be adopted; say as in fig. 389. One reason why guttering is objectionable to all thatched roofs is, that, by the continual decay of the thatch, they are very apt to become choked up. A large clumsy gutter, like that shown in fig. 388, is, no doubt, less liable to this than a smaller gutter, such as is suitable for a thatched roof with slated eaves, like that in fig. 389; but both will be found to require continual attention, and, after every violent shower, to be apt to choke up the descending pipe. There is a porch of trelliswork to this Design, which is so far good, as any description of porch is better than none; but there are two trunks of trees, in the manner of columns, without plinths below, and without any thing in the way of an entablature above, which, we must say, we think in superlatively bad taste. What can be worse than a column supporting nothing but thatch? There is a false window to the parlour, on one side of the porch, which we disapprove of; because there must be something deficient in the invention of the Architect, when such windows are found requisite in buildings of this description. A window in a thatched roof is always bad; because the number of angles which it presents to the wind and the weather, makes the thatch which covers them go rapidly into decay, and soon admit the rain. If such windows are ever admitted, they should be in the style of that shown in Design XX., or in fig. 157. We never can bring ourselves to consider thatch as a proper covering for a building of two stories; we would limit it to low buildings, with mud or rubble-stone walls, and where no guttering was required: but let taste be free. The compactness of the plan, however, is commendable; and this is, perhaps, all that we can say in its favour. The cubic contents of this Design are 19,632 feet, from which our readers may easily form a General Estimate.



Design LXXIV. — *Design for a Cottage Dwelling, in the Old English Style, and of a Construction suitable for having Part of the Walls covered with Weather-Tiling.*

458. *Accommodation.* The ground plan, fig. 390, contains an entrance-lobby, *a*; hall and staircase, *b*; parlour, *c*; kitchen, *d*; wash-house, with oven-boiler and sink, *e*; pantry, *f*; dairy, *g*; beer cellar, *h*; and coal cellar, *i*. The chamber floor, fig. 391, contains three good bed-rooms, *k*, *l*, and *m*; and a light bed-closet over the lobby, *n*.

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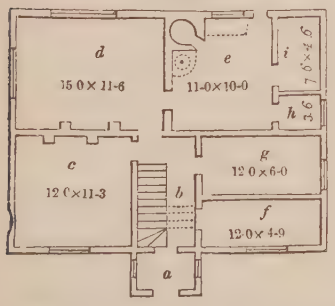

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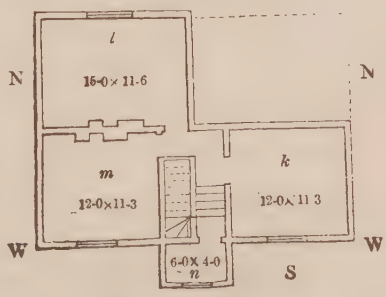

459. *Construction.* The foundations and walls of the ground-floor story should be of brick, or of rough stone with brick dressings (bricks at all the angles, whether of doors, windows, or corners), and with brick arches to the windows. These walls, of whatever material constructed, should have what is called a Welsh cornice (two or three over sailing (protruding) courses of brickwork, one of which has dentils, formed by the ends

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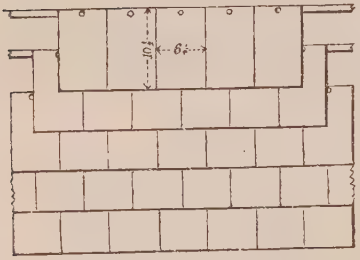

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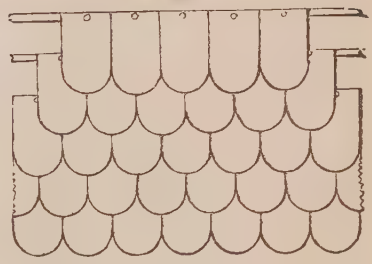

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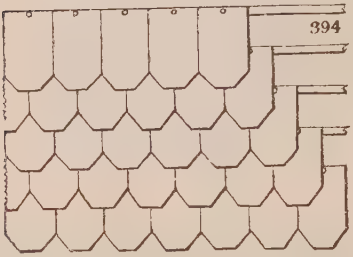

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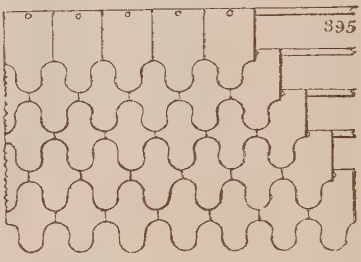

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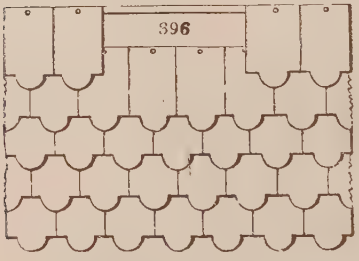

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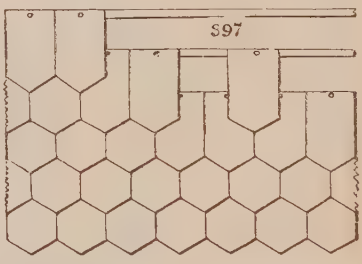

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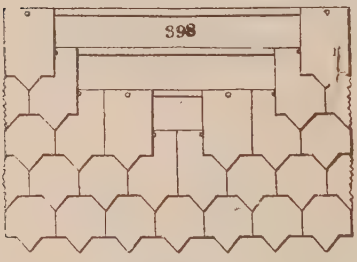

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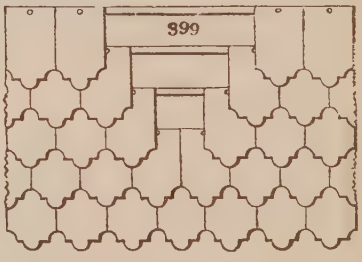

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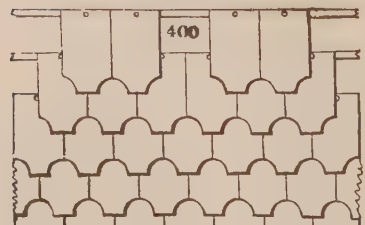

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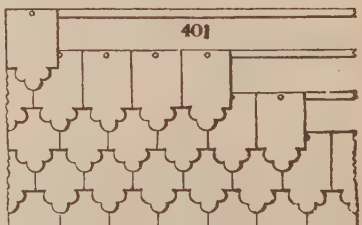

of bricks projecting at equal and regular distances,) to finish with at top; in order that the lower part of the weather-tiling, which is to cover the bed-room walls, may incline outwards, for the purpose of throwing off the water, and preventing it from running down the walls of the ground floor. The external partitions of the chamber floor should be formed of timber framing, lathed horizontally, to receive the tiling, which may be of any pattern, according to fancy. Our contributor has sent sketches, figs. 392 to 402, of all the different kinds which he recollects having seen; but as two or three sorts are generally used together, arranged alternately, it would be fruitless, he says, "to attempt sending all their combinations. It is very common to have two, three, or more courses of ornamental tiles, separated by a row of plain ones, which has a good effect." For the present Design he recommends employing successive courses of figs. 393, 394, and 395, separated by a course of fig. 392, as shown in fig. 402, "which would produce an agreeable play of light and shade, showing off some of the most pleasing alternations of straight and waved lines that this species of material is capable of producing." It will generally be found advisable to colour the whole of the weather-tiling a light stone or cream colour, and the brick or stone walls below may be left uncoloured, or not, according to whether the natural tint of the material employed is agreeable or otherwise. The roof is to be covered with the common plain tiles, and its picturesque beauty will be much improved if they are old ones that have lost the glaring hue which all tiles have when they are fresh from the kiln." With respect to colouring the materials of a building, it may be observed that it is not liable to the same objections as either plastering them over, or roughcasting or whitewashing them; because colouring, being much thinner, does not, to the same extent, disguise the nature of the material, and thus either destroy the natural expression of, or give a false expression to, the wall. A wall may be said to have its true and natural expression, when, at the first glance, it shows the materials of which it has been constructed; the manner in which these materials have been put together; and the principles of construction on which it depends for its stability, strength, and duration. Now, a brick or stone wall, on the external face of which the distinct shapes of the bricks or stones are clearly discernible to the eye, is the same thing, in point of the useful qualities mentioned, whatever may be its colour; but if the joints of the stones or bricks, and their surfaces, are covered with plaster or roughcast, or with such a thick coat of whitewash as to obliterate their forms and lines, the wall has lost its natural expression: it may be of brick, or it may be of hewn stone; but as every body knows that whitewashing is generally applied for the purpose of disguise or concealment, it is fair to conclude that, wherever it occurs on the external walls of buildings, they are made of lath and plaster, or mud. To return to our Design, the general effect of the weather-tiling will be seen in the elevation of the entrance, or north-west front, fig. 404; in the south-west side, fig. 405; in the south-east end, fig. 406; and in the north-east side, fig. 407. The use of weather-tiling in England is chiefly confined to the marine

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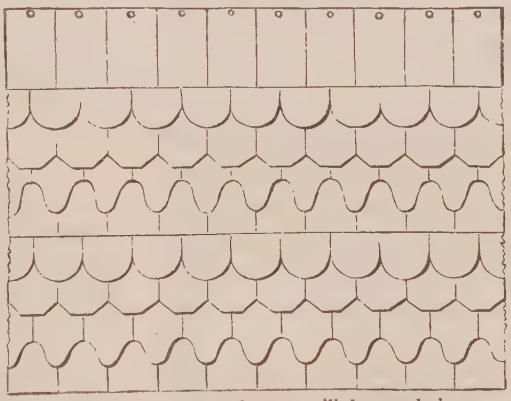

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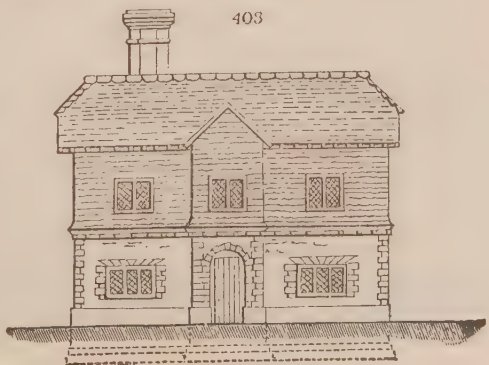

districts, where it is employed for casing the walls of buildings, whether formed of wood, brick, or stone, to protect them from driving winds that carry with them the spray or the sea, which, from the salt it contains, would otherwise render the walls damp. Weather-tiling is also used in some parts of the interior of the country, on the south-west and west sides of buildings, to protect them from the rains, which, in England, are not only more frequent from that quarter than from any other, but which are almost always accompanied by high driving winds. The most suitable weather-tiling, for this purpose, is that commonly called mathematical tiling, which is made to imitate bricks; but we shall defer our description of this kind of tiling till some future occasion.

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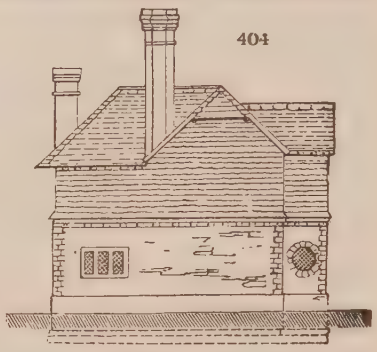

460. *General Estimate.* Cubic contents, 18,749 feet, at 6*d.* per foot, £468 : 14*s.* : 6*d.*; at 4*d.*, £312 : 9*s.* : 8*d.*; and at 3*d.*, £234 : 7*s.* : 3*d.*

461. *Remarks.* This Design has been sent us by our valuable contributor Mr. Varden, chiefly with a view of showing the application of weather-tiling, as practised in the neighbourhood of Guildford, in Surrey. Speaking of the Design before us, its author observes that "it is one of the largest erections for which this manner is suitable. The effect generally pleases, from its homely and comfortable appearance. The masses are usually very irregular, convenience being more studied than uniformity; nevertheless, sometimes combinations of form occur, that would be highly gratifying to a lover of the picturesque, and might even afford useful hints to the professional Architect. This manner of building requiring an economical plan, the Architect avoids all breaks that are not absolutely necessary, and never allows the roof to project more than is wanted to throw off the water clear of the walls. Ornament is never intentionally introduced; and there is nothing in this style incompatible with the humble character of a cottage dwelling." The ground plan is compact, and the two principal fire-places are against the interior walls. It would have been easy to have changed the position of the oven and boiler in *e*, so as to have carried up the flues from them along with the others, and thus had only one stack of chimneys instead of two; but our contributor, in all probability thought that the boiler would be more convenient adjoining the sink; and, perhaps, also, he considered that two chimneys in the elevation would be more picturesque than one. For our own part, we consider that a boiler and an oven, when placed in the interior of a house, add so much to its comfort by serving as reservoirs of heat, that we always regret to see them placed against outside walls. Many persons, we are persuaded, are not sufficiently aware of the great quantity of heat that is generated in an oven, by the consumption of the most worthless looking spray or brushwood, which no good housewife would ever think of burning in an open fire-place. It is only by having an oven, surrounded by a mass of brickwork, that this spray can be properly turned to account; burned in an open fire, its heat is dispersed in the atmosphere, and speedily lost to the apartment; but burned in an oven, and the more rapidly the better, its heat is absorbed by the brickwork, and continues to be given out slowly during many

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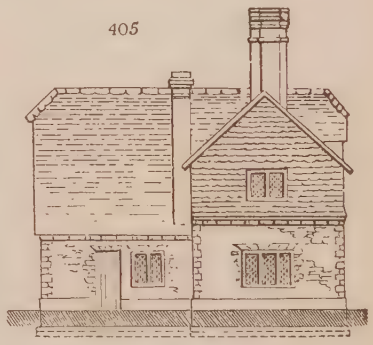

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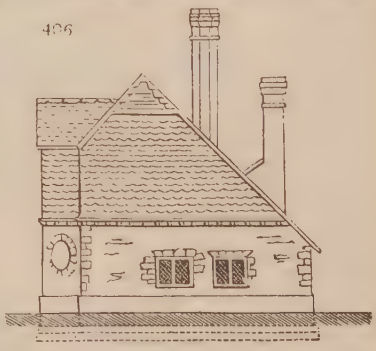
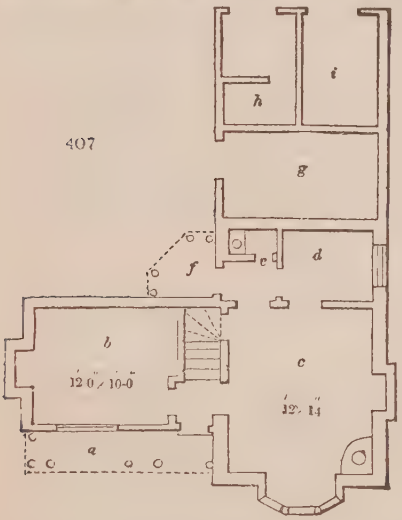


hours afterwards, to whatever surrounds it. If the oven has a horizontal flue proceeding from it, either under the floor as in our model cottages, or above it as a bench in the German or Chinese manner, both to be hereafter described, the heat given out will be so much the greater. The occupiers of cottages have much to learn in respect to the best mode of consuming fuel, and economising heat: but to be taught this they must become readers; or, we must have parochial discourses on economical subjects, as well as sermons on religious and moral duties.

Design LXXV. — *A Cottage in the Old English Manner, containing on the Ground Floor a Living-room, Kitchen, and other Conveniences, with Two Bed-rooms over.*

462. *Accommodation.* From the front porch, fig. 407, *a*, the entrance is to a passage and staircase, which leads on the left to a living-room, *b*; and on the right, to a kitchen, *c*; from which there is a closet, or coal cellar, under the stairs. From the kitchen there is a door to the dairy, *d*; and another to a lobby, which leads to the water-closet, *e*; and to the common entrance porch, *f*. There are a cow-house, *g*; a pigsty, *h*; and a place for hay and straw, *i*. The chamber floor, fig. 408, contains two good bed-rooms, *k* and *l*; one of which has a fireplace.

407



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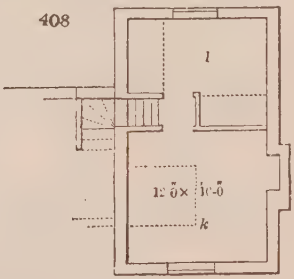

463. *Construction.* The walls are of brick nine inches thick, and the partitions are of brick nogging flat. The roof is slated, and the chimney stacks are of brick set angularly. These angular chimneys are thus constructed: the shaft being finished square, as shown in fig. 409, an earthenware circular flue-pipe is placed over the opening of the chimney, and the square flue is made to unite smoothly with it, by being pargeted with mortar made of fresh lime and powdered brick. Bricks are then built round the upright pipe, leaving vacuities not filled up with mortar, in the four angles formed between the bricks and the pipe. As the work is raised in height, pipes are added; the length of each pipe being two feet, and each having an outside rebate at one end, and an inside rebate at the other, so as to admit of a perfect junction. We may observe that the diameter of these pipes may be from nine to thirteen inches, according to the size of the fireplace below; and we shall show, in Book III. of this work, that by having tubes of this sort, of two feet, one foot nine inches, and six inches, rebated as above, flues might be built in any direction, however crooked, which would require no climbing boy to sweep them, and would be attended, as we think, with all or most of the advantages of the circular flues of Hiort, Chadley, or Smith, at a comparatively trifling expense. Fig. 410 shows the plan of the projecting bricks set on edge, which form the dentils that support the capital of the shaft. Fig. 411 represents one of the chimney tops

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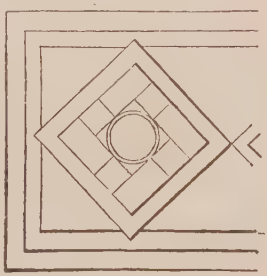

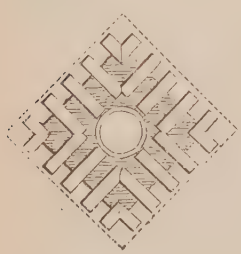

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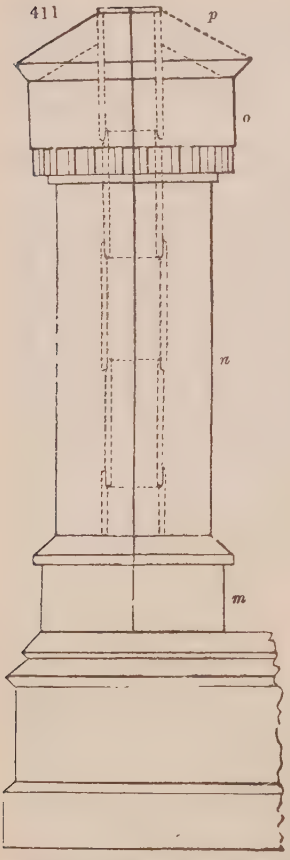

complete, with its base, *m*; shaft, *n*; capital, *o*; and capping, *p*. Wherever a "tall boy" (see § 432.) is required to make a chimney draw, we would enclose it with brick or stone, in this, or in some similar manner, and thus get rid of those house-top deformities so cleverly ridiculed in the *Mechanic's Magazine*, vol. xvii. p. 316. "How generally," says this writer, "do we see fine terminations become pedestals for every foul thing in the shape of a cowl, a mitred, a caped, an uncaped, a vandyked, a perforated, a conical, a crooked, or a straight, "tall boy;" or to support a black pot, or a red pot, or some of the numerous devices which start up in such great profusion and variety, as soon as a new house is inhabited, or an old one changes its tenant: thus, as it were, proclaiming from the house-top, that the Architect and builder have been unsuccessful, and that some variety or other of the tinker's or potter's whims, to charm or coax out the smoke, has prevailed." What are called the genteel cottages about London, indeed, are, in this respect, a disgrace to their Architects and builders. The cow-house, hay-shed, and piggery are supposed to be of studwork,

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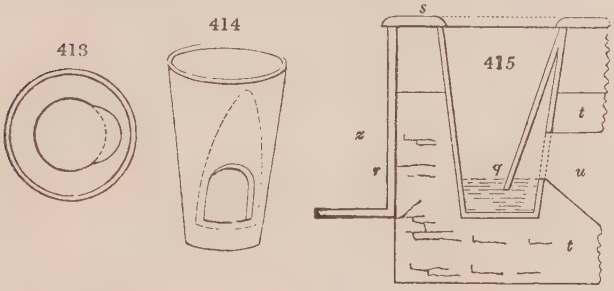
weather-boarded, and roofed with pantiles. The ceiling of the living-room is curbed, or coved at the sides (see the section fig. 412), by which means some addition is made to its height from the roof. Further details of construction will be found in the following specification and estimate; which, it may be observed, does not include the cow-house, hay-shed, and pigsty; the ingenious contributors of this Design, Messrs. W. and H. Laxton, considering that the occupant might be able, with a little assistance from a carpenter, to erect these additions at his leisure hours. The prices stated in the estimate, we should observe, are calculated for the neighbourhood of London, in the year 1832.

464. *Bricklayer and Digger's Work.* To build the walls, as shown in the plan, one brick thick, with one brick and a half footing, one foot high: —

	£	s.	d.
Five rods of reduced stock brickwork, at £12 per rod	60	0	0
Twenty-four yards and a half superficial of brick nogging flat, to the partitions on the ground-floor, at 3s. : 3d. per yard	3	19	8
Two yards superficial of stock brick paving laid flat, for the closet or coal cellar under the stairs, at 2s. : 3d. per yard	0	4	6
Two hundred and fifty-two feet superficial of foot tile paving to the kitchen, dairy, and fire-places, at 6d. per foot	6	6	0
Twenty-five feet lineal of eight-inch draining pipes, and digging for laying them, from the water-closet and sinkhole, to a tank in the yard, or some other part of the grounds, at 1s. per foot	1	5	0
A cast-iron basin and trap to the water-closet, figs. 413, 414, and 415.	0	10	0

(Fig. 413 is the surface plan of the basin; and fig. 414 is a view of it before it is built in. Fig. 415 is a section of the



basin, as built in; in which *q* is the trap; *r*, the riser of the seat; *s*, the seat; *t t*, the brickwork of the drain; and *u*, the drain. It is evident, from this figure, that no smell can penetrate from *u* upwards, it being intercepted by the trap, *q*; and the water into which it dips.)

	£	s.	d.
Digging out foundation, levelling, &c., say	1	0	0
Ten squares of countess slating, laid on three quarters of an inch battening, with eaves, boards, and tilting fillets to the rakes, complete	17	10	0
Forty feet six inches lineal of ridge tiles	0	13	6
Three chimney pots formed in brickwork, set angularly	1	10	0
	£92	18	8

465. *Carpenter's Work.*

Rafter and ceiling joists, four inches by two inches; ridge pieces, nine inches by two inches; wall plates, four inches by four inches; purlins, four inches by four inches; joists, seven inches by two inches and a half; bond, four inches by two inches and a half; and lintels, four inches by four inches: one hundred and forty-eight cubic feet of Memel fir timber, including labour and nails	25	18	0
Three squares and a half of four-inch quartering in partitions, framed complete	5	5	0
Three squares and a half of one-inch deal wrought folding floors	7	0	0
One hundred and seventeen feet lineal of skirting worked out of two-cut battens, including wooden bricks and backings	2	8	9
Seventy-four feet superficial of one inch and a half square framed partition, between the stairs and the small bed-room	2	15	6
Eight one inch and a half four-paneled square doors, six feet six inches high, by two feet six inches wide, with one inch and a quarter single rebated linings, and a moulding round both sides; hung with three-inch butt hinges, and having a six-inch iron-rim two-bolt lock to each	11	4	0
Two outside bead butt and square doors, with fir frames, four inches by three inches, rebated and beaded, with a moulding round inside. The doors hung with three-inch butt hinges; and having two bolts, and a seven-inch three-bolt iron-rim lock to each	3	12	0
Four window frames and mullions, containing seventy-six feet lineal, of one and a half inch deal, wrought, rebated, and beaded, four and a half inches wide, with forty-eight feet lineal of moulding round the frames inside	2	0	0
One bay or bow window in three divisions, containing thirty-eight feet six inches lineal frame and mullions, four inches by four inches, wrought, framed, rebated, and beaded. Twenty-four feet lineal of moulding inside, and fourteen feet lineal of moulded cornice and base, to the top and bottom of the frame outside	1	10	0
Six three-quarter-inch proper ledged lifting shutters to the lower windows, four feet by one foot six inches, with fastenings	2	5	0
A flight of stairs, containing fifty-three feet superficial of one and a quarter inch deal steps, and inch risers, bracketed and housed into			

	£	s.	d.
strings, fifteen feet superficial, one inch and a half deal wall string, and seven feet superficial of ramped ditto; twenty-five feet lineal of beaded capping, and three feet of framed newel	3	17	0
One small skylight, frame and lining, to the upper part of the stairs, in the roof	0	7	0
One and a quarter inch deal seat, riser, and bearer, to the water-closet, with hole cut and cover lined, and skirting round	0	12	0
	£68	14	8

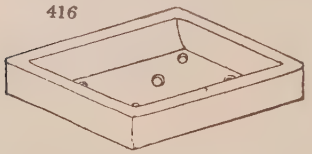
466. *Plasterer's Work.*

Sixty yards of lath, plaster, set, and whiting, for the ceilings	4	0	0
Twenty-three yards of ditto and colouring, for the partition	1	14	6
One hundred and sixty yards of plaster, set, and colouring, for the walls	6	0	0
Eighty-six feet lineal of cement skirting, seven inches wide, to the kitchen and dairy	1	8	8
	£13	3	2

467. *Stonemason's Work.*

A moulded profile stone chimney-piece to the living-room; and a set of flat jambs, mantle, and slabs to the bed-room; and a set of one inch and a half ditto to the kitchen	3	5	0
Four stone sills to the windows, and two stone steps to the outside doors	2	5	0
A stone sink seven feet superficial, with grating and iron socket, waste pipe, two five-holes sink stones (dish hollowed out), fig. 416	1	14	0
	£7	4	0

416



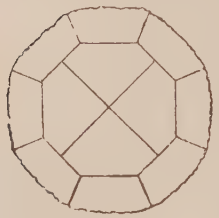
468. *Sundries.*

Ten feet lineal of three-quarter-inch pipe, with stopcock to the water-closet	1	0	0
Seventy-five feet superficial glazing to casements in small squares	4	7	6
Seven iron casements, as in fig. 287, three feet four inches by one foot seven inches; and seven ditto, four feet by one foot seven inches	5	15	6
Painting woodwork inside and outside, four times, in oil colours	4	0	0
Centring for doors, windows, and chimneys, and bedding and pointing (filling up the joints)	1	0	0
	£16	3	0

469. *Extra Work for the Porch.*

Twenty-six feet reduced brickwork in the footings, and digging out the foundations for them	1	6	0
Eight yards superficial of pebble paving	1	4	0
Three quarters of a square of slating and battening	1	6	3
Nine oak posts, five inches square, with chamfered angles, and having the slabs of trees with the bark on, nailed round them, to imitate the trunks of trees, fig. 417	4	10	0
(Trunks of trees very soon rot, if the bark be not removed; and the mode above recommended has all the appearance required, with increased durability.)			
Eighteen one-foot tiles for the tops and bottoms of the posts	0	9	0
Ten branches of trees to form arches	1	5	0
Twenty cubic feet of Memel fir to the roof	3	10	0
Thirty-seven feet six inches superficial of three quarters of an inch deal soffit and fascia wrought and beaded	0	18	9
	£14	9	0

417



470. *Extra Expenses to the Exterior of the House.*

	£	s.	d.
Eighty-one feet lineal three-quarter-inch deal eaves, fascia beaded, with lath and stucco soffits and backings, and cast-iron eaves gutters, and painting	8	2	0
Thirty feet lineal of two-inch cast-iron pipes, with heads and shoes	2	0	0
Sixty-six feet lineal one and a half inch verge board to gables, ten inches wide, wrought, moulded, and cut, with stuccoed soffits	4	19	0
Two oaken pinnacles	0	12	0
Label moulding to three windows	0	15	0
Seventy-six lineal feet of beading round the ceilings of the living-room (fig. 418.)	0	19	0
	£17	7	0

418

471. *Summary of Estimates.*

Bricklayer and Digger	92	18	8
Carpenter	68	14	3
Plasterer	13	3	2
Stonemason	7	4	0
Sundries	16	3	0
Total expense of the building, plain	£198	3	1
Extra work for the porch	14	9	0
Extra expenses to the exterior	17	7	0
Total expense with a porch and other extras	£229	19	1

472. *General Estimate.* The cubic contents of this dwelling are 11,686 feet, which, at 6*d.* per foot, make £292 : 3*s.* ; at 4*d.*, £194 : 15*s.* 4*d.* ; and at 3*d.*, £146 : 1*s.* : 6*d.* As Mr. Laxton's estimate amounts to £229 : 19*s.*, it thus appears that about $4\frac{3}{4}$*d.* per foot is a fair price for buildings of this description, in the neighbourhood of London, in the year 1832.

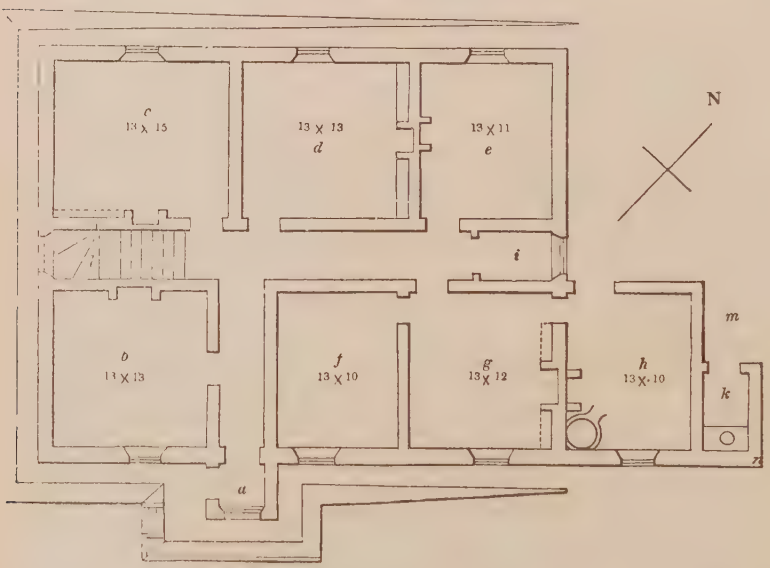
473. *Remarks.* The general effect of this building is good; but, for comfort, and especially warmth, the chimneys ought not to have been in the outside walls. In countries where fuel is abundant, or in those where fire is wanted chiefly for cooking and washing, this will be no great objection; but, in Britain, no exterior beauty or character can, in our opinion, compensate for having the fireplaces in the outside walls. When the chimneys are in the interior walls, they not only keep the whole house warm, but they invariably draw better. Knowing, and being deeply impressed with, these two facts, chimney shafts, when rising from the centre of a roof, always appear to us more beautiful than in any other position; and in this sentiment we think we are correct, because the origin of all beauty must necessarily be utility. The difference between us and those who prefer the chimney shafts on the gable ends, consists in their judging with reference to a different standard. If we ask what that standard is, we shall generally be told that it is picturesque effect; sometimes, perhaps, the imitation of particular styles of cottage building, which have resulted from accident; and occasionally, though rarely, symmetry and regularity. In our opinion, the grand and fundamental principle of exterior beauty in dwellings is to be found in their internal accommodation and comfort. Whatever is required by or consonant with this, must be beautiful in the eye of reason; and all exterior beauty inconsistent with this, must depend on associations, which, not having their origin in reason, may be called arbitrary or accidental, and ought therefore not to be relied upon. All Architecture being founded on necessity and reason, and not on the imitation of any objects whatever, either of nature or art, it follows that the external beauty of any edifice as a whole can never be truly judged of, without a knowledge of the uses for which it is designed. So also the beauty or propriety of the various parts and details of a building, such as walls, supports, openings, &c., cannot be properly appreciated, unless we know the nature of the materials employed. We cannot, for example, decide as to the width of a doorway or a window, unless we know the materials of the wall in which the opening is made; as well as the mode, whether by an arch or a lintel, in which that opening is covered. Neither can we estimate the weight which any prop or column will bear, unless we know the material of which it is composed. The proportions of a column, in timber, which may be very suitable for what it has to support, and therefore beautiful, would be more than sufficient, and therefore cumbrous and inelegant, in stone, and still more so in iron. It is true, that, in judging of doors, windows, and columns, a very small portion of man-

kind do so with reference to this standard; but it is not, on that account, the less founded on reason. The common standards of Architects, whatever may be the material employed, are the models handed down to us by the ancients; and the common standards of the rest of mankind are the works erected by the Architects for the time being. Thus precedent takes the place of principle; and in Architecture, as in every thing else, fashion ultimately usurps the part of reason. But it is the province of criticism to test the fashions of the day, by a recurrence to first principles, and to endeavour to recall mankind to the consideration of fundamental laws. In no art is this more requisite than in Architecture; the pretended knowledge of which has hitherto, in all ages and countries, been in the hands of a few; but which, to be improved and brought to perfection, ought to have its principles universally studied and understood, so as that its works may be examined and criticised on these principles by the many. In the infancy of all art, the many are necessarily led by the artists, and their arbitrary rules become law; but, with the progress of things, the many become enlightened, and, judging for themselves, force the professors of art to recur to fundamental principles; and it is self-evident, that, in a useful art, these principles must be based on utility. These remarks are not more applicable to this Design than they are to several others; but we consider it necessary to make them, with a view of impressing on our readers the necessity of mainly depending upon their reason, in judging of all architectural works whatever.

Design LXXVI. — *A Cottage Dwelling, One Story high, containing Six Rooms, a Wash-house, and other Conveniences.*

474. *Accommodation and Construction.* The ground plan, fig. 419, contains an entrance-porch, *a*; breakfast-room, *b*; dining-parlour, *c*; two good bed-rooms, *d* and *e*; with two closets in *d*; a servant's bed-room, *f*; kitchen, *g*; wash-house, *h*; and privy,

419



k. There is a cellar under *c*, which is descended to by the stairs, *l*. A well may be dug, and a pump fixed either in the wash-house, or in the yard, *m*. The wall *n* may be continued at convenience, the south-east side of it enclosing a yard, in which may be placed a chicken-coop, pigsty, coal-house, dirt-bin, wood-house, and other conveniences; and the north-west side may form one wall of the garden, against which, of course, fruit trees may be trained. It is proposed to have a cistern for rain water, over a part of the wash-house, to be formed of wood, and lined with zinc, as being much cheaper than lead. To this the water is to be conveyed by large wooden gutters, lined with zinc, to the thatched roof. The waste water from this cistern, and from the wash-house and from the pump, is to be led through the drain of the privy, to the liquid manure tank. The walls are proposed to be of chalk-stone with brick corners; and with brick facings

and labels to the doors and windows, which are intended to have stone sills; the roof is to be thatched with reeds, and the chimney tops are to be formed of Roman cement. The whole is to be embraced by a platform on three sides.

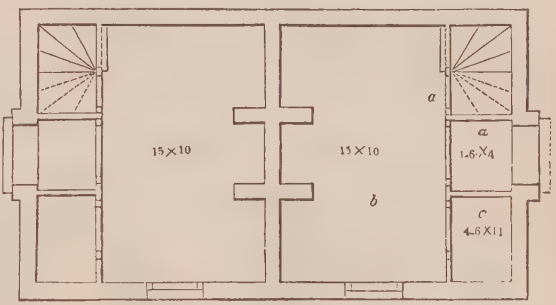
475. *General Estimate.* Cubic contents, 13,308 feet, at 6*d.* per foot, £332 : 14*s.*; at 4*d.*, £221 : 16*s.*; and at 3*d.*, £166 : 7*s.*

476. *Remarks.* This Design, which has been sent to us by our much-valued contributor, Samuel Taylor, Esq., of Stoke Ferry, Norfolk, is calculated for being built of chalk-stone, which forms the cheapest material of that country, and for being covered with reeds, the produce of the adjoining fens. It forms a comfortable and commodious dwelling, expressive of what it is; and, from the height of the walls and the proportions of the windows, is rather elegant than otherwise. We cannot justify the Gothic labels over the doors and windows, immediately under a far-projecting roof; because no other part of the building is in the Gothic style, and because labels of any kind, in such a situation, cease to have any character of use. "From truth and use all beauties flow." (*Epistle to Lord Lowther on Building and Planting.*)

Design LXXVII. — *The Model Cottages of the Labourer's Friend Society, as erected at Shooter's Hill, Kent.*

477. *Accommodation.* These cottages are built in pairs, in such a manner as to have the fireplaces in the party walls; the ground plan, fig. 420, shows, for each cottage, an entrance-porch, *a*; kitchen, *b*; pantry, *c*; and closet under the stairs, *d*. The chamber floor, fig. 421, shows two good bed-chambers to each cottage, without fireplaces. The privy, pigsty, and other conveniences, are built apart. To each double cottage are annexed two acres and a half of land.

420



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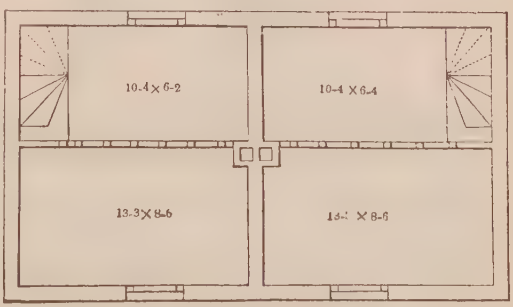


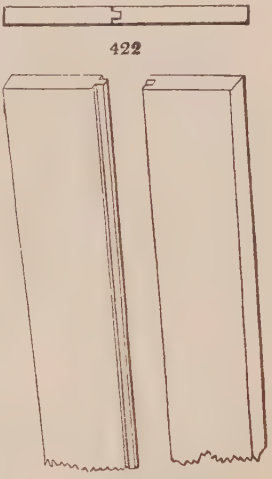
478. *Construction.* The walls are raised on grouted foundations (grout is composed of fresh lime and gravel, mixed, and immediately thrown in, beaten down, and left some days to consolidate), two feet broad and two feet deep; over which are two courses of twenty-two inches in width, and two of eighteen inches, as a footing, and four courses of fourteen inches as a plinth. The walls above are nine inches, and hollow, and one course of slates is laid before the floors commence. The bricks are all hard stocks; the timber Swedish or Baltic; the window sills and landings of York stone; the chamber flooring of inch and quarter deal, ploughed and tongued (a groove made along the edge of one board, and a tongue or projection worked along the edge of the other, to fit into it, fig. 422); the window casements are of iron, and the roof slated. The course of slates is laid along the walls, just beneath the ground floor, in order to prevent the damp from rising through the vacuities, which are two inches wide, being formed in the manner shown in fig. 7, § 25. The brickwork is worked to a smooth face inside, and not plastered, but only whitewashed. The outside of the walls is thus left rough, and it is brought to an even surface by rough-casting it with a mixture of lime and fine gravel, which, when completed, has the colour and texture of Bath stone. The floors of these cottages are fifteen inches above the general level of the surrounding ground: twelve inches of this space is filled with gravel, and the top

three inches with grouting, which forms a hard bottom, upon which is laid a flooring of foot square paving tiles. The roof, as shown in fig. 423, projects, in order to keep the walls dry.

479. *Estimate.* Twelve of these cottages have been erected on Shooter's Hill, at £115 per pair, under the direction of our contributor, W. Bardwell, Esq., for the Labourer's Friend Society. The cubic contents of the building are 9620 feet; which shows that $2\frac{3}{4}d.$ per cubic foot is the proper rate for making a general estimate for this description of dwelling.

480. *Remarks.* This Design, which has been published in *Facts and Illustrations demonstrating the Benefits derived by Labourers from possessing small Portions of Land, &c.*, vol. i. p. 31, was recommended to us, for our work, by its author, Mr. Bardwell. Considering the size of the rooms, these dwellings are certainly remarkably cheap; and we are informed that, in consequence of the grouted floors and hollow walls, they are the driest cottages in the neighbourhood where they are built. We agree with the writer, who describes them in the work referred to, that, as all the materials are of the best quality, these cottages will be as durable as they are cheap; and that they may justly be considered elegant, from the proportions of the openings, the pediment ends, the low pitch of the roof, and "the Doric simplicity of their general form."

422



The quantity of land annexed

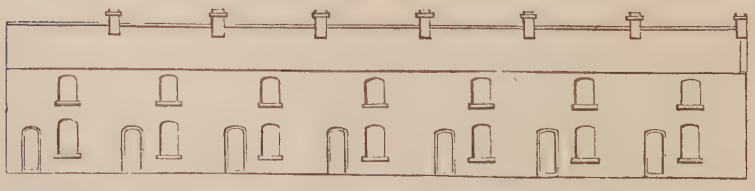
423

to them seems large; but the reason may be that the occupiers are supposed not to have regular employment, and to find a ready market for garden produce.

Design LXXVIII. — *Six Cottage Dwellings, built at Abersychan, near Pontypool, in South Wales, with One common Wash-house and Bakehouse.*

481. *The object* of building these dwellings, of which fig. 424 is the elevation, and 425

424

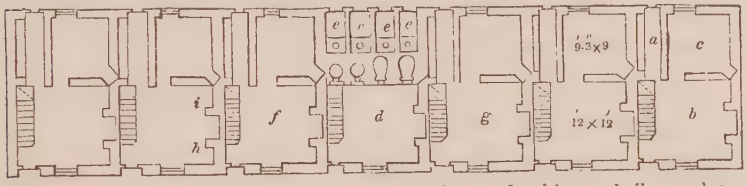


the ground plan, both to a scale of five sixteenths of an inch to ten feet, was to afford lodgings for the workmen of Messrs. Jones and Wilcox, builders, of Bristol, during the

time they were employed in erecting the extensive furnaces of the British Iron Company at Abersychan.

482. *Accommodation.* The ground plan of each dwelling shows a passage, with a wooden dresser along the side, fig. 425, *a*; living-room, *b*; and back-kitchen, *c*; over

425



which are two good bed-rooms. There are a wash-house, *d*, with two boilers and two ovens, common to the whole; and four privies, *e e e e*. The front room, over the bake-house, belongs to the dwelling, *f*, which was occupied by the foreman of the masons; and the back room, over the privies, belongs to the dwelling, *g*, which was occupied by the foreman of the smiths. Each dwelling has a strip of garden-ground behind, and they are all supplied with water by a mountain stream, which afterwards passes through the drains of the privies.

483. *Construction.* The walls are of stone, quarried on the spot; the outside and party walls are eighteen inches in thickness, and the inside ones one foot. The floors are paved with stone, and the roofs covered with grey slate. The elevation, fig. 424, is wholly without ornament.

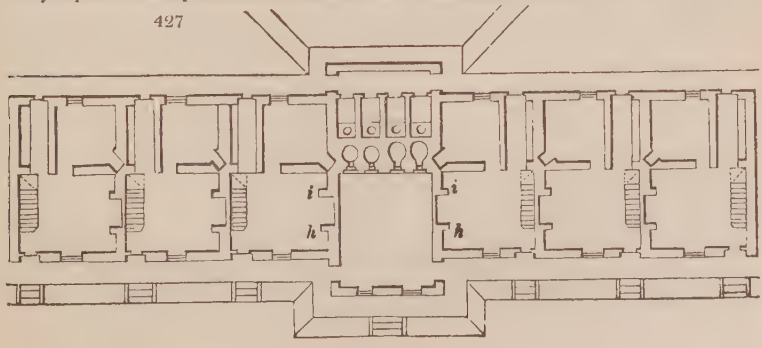
484. *Estimate.* These dwellings cost, including the wash-house, privies, enclosing the garden ground, &c., £800, which gives £133 : 6*s.* : 8*d.* for each cottage. As the whole line of building contains 61,005 cubic feet, it appears that 3*d.* per foot is the proper sum for employing in its general estimate.

485. *Remarks.* This Design was sent us by our esteemed friend, Samuel Taylor, Esq., as a specimen of a very cheap and simple mode of building dwellings of the lowest degree of accommodation in a stone country. The elevation has nothing to recommend it in point of effect: but, by advancing the wash-house in front; by putting a screen wall before the privies behind; by reversing the position of the doors of the three dwellings on the right-hand side of the centre, in order to get the fireplace of the end one against a party-wall, as well as to maintain uniformity in the position of the doors and windows; by projecting the roof at the eaves, and forming pediment ends; by introducing a string

426

course under the bed-room windows; and by raising and ornamenting the chimney tops, a very superior description both of elevation and plan, figs. 426 and 427 will be produced.

427



If such a line of cottages were erected in a country where fuel was dearer than it is at Abersychan, it might be worth while to keep the floor of the wash-house three feet lower than that of the dwellings, and to conduct the flues from the boilers and ovens under the floors of the living-rooms, in the manner indicated in § 19. Perhaps some might think that it would be an improvement in our elevation, fig. 426, to bring the windows of the living-rooms more into the middle of the space between the door and the party-wall; and also to bring the door to the back-kitchen into the middle of the space between the passage door and that party-wall, as in figs. 428 and 429; and we grant it

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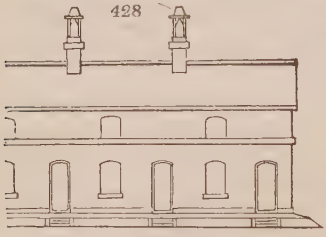

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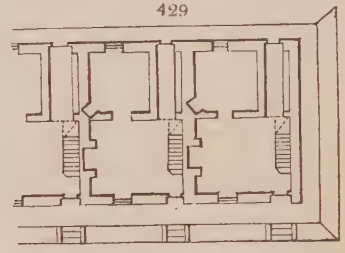
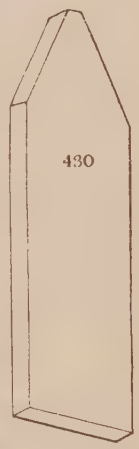


would, looking no farther than mere symmetry: but in figs. 425 and 427 there are spaces in the living-rooms at *h*, and also at *i*, in which a person may be seated at work without being in the draught between any opening and the fireplace; and also in which tables or dressers might be placed: but supposing the door of the back-kitchen and the front window placed in the middle of their respective walls, as in fig. 429, there will be no place for either table or dresser, and the whole room will become, as observed by one of our correspondents § 365, a complete "Temple of the Winds." Thus, though there cannot be a doubt that, in point of architectural symmetry, the elevation, fig. 428, is much more beautiful than fig. 426; yet, in point of fitness, that is, with reference to the interior plan, the latter is decidedly more beautiful than the former. Can there be a doubt, then, which kind of beauty ought to be preferred, in cases of this sort? We say there cannot. The most useful is unquestionably the most beautiful. When the question is between a beauty belonging to the expression of art, and a beauty connected with fitness for enjoyment, it is clear to us that the decision ought to be in favour of the latter. The great object of the Architect ought to be, to combine the two species of beauty; but as this cannot be done in every case, it is clear, that in judging of a building merely by its exterior, unless we are intimately acquainted with its use, we can only decide as to its symmetry, or other architectural expression. To form a just taste in architecture therefore, it is as necessary to study all the various purposes to which the different parts of the interiors of buildings are applied; and the different modes of lighting, warming, and ventilating, of supplying water and draining, of avoiding bad smells, damp, dry rot &c., as it is to study the original or conventional beauty of lines and forms. It may be useful to observe that the chimney tops in figs. 426 and 428 are formed by setting up four slate stones, such as fig. 430, two about a foot, and two about eighteen inches broad, and all from three to four feet high; firmly flanching them to the top of the chimney shaft with cement, and sometimes cramping them with iron into each other. Over these slates is placed a two-feet square slab, fig. 431; and on that a truncated pyramidal stone, fourteen or sixteen inches square at the base, fig. 432. The handsomest cottage chimneys on the banks of the lakes of Cumberland and Westmoreland are formed in this manner; and we shall give specimens of some of them in the historical part of this work.

430



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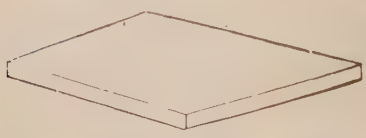

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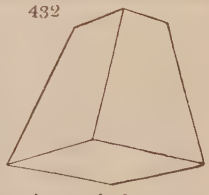

Design LXXIX. — *Twelve or more Cottages in a Row, with a Kitchen, Wash-house, and other Conveniences, in common; the whole heated by the Fires in the public Kitchen.*

486. *The object of this Design* is to show how the modes of heating under the ground floor, and of having a common kitchen and wash-house, may be applied to a number of houses together, so as to produce very comfortable dwellings at a very moderate expense. By rendering fireplaces and chimneys unnecessary, not only is the expense of building them avoided, but also that of employing any other material than mud or earth in any part of the walls, or of having them, in any part, more than nine or ten feet high. It will be evident, after considering this Design in detail, that the domestic labours of a family living in one of these dwellings will be considerably diminished, and their comforts, at the same time, greatly increased.

487. *Ground Plan of the public Offices.* The dwellings and offices may be either erected in a straight line, or in a curved line; or they may form two or more sides of a quadrangle. For so small a number as twelve, we prefer a straight line. At one end of this line we place the common kitchen, fig. 433, *a*; in which there are two ovens for baking and roasting, *b*; an open fireplace, *c*; and three boilers for cooking and washing, *d*. The floor of this kitchen is four feet below the level of the floors of the dwellings, in order that flues from the ovens, and also from the boilers and the open fireplace in the centre, may be conducted under the floors of the drying-room and sitting-rooms, for heating them. Two ovens are shown, because, in the most severe weather in winter, the heat from one oven may not be sufficient for the floors. There are three boilers, in case of accident to one, and also because one boiler may be required for washing or brewing, while the others are being used, the one for boiling potatoes, and the other for making soup. The open fireplace is for the cooking of small articles by individuals. The roasting and baking is supposed to be carried on in the ovens, and the boiling meat chiefly in one of the boilers, in which also vegetables may be introduced to form soup; while another boiler may be devoted exclusively to potatoes; and the third to hot water. There may be a large table, with benches along its sides, in the centre of this kitchen, at which those who choose may dine. There are a cellar, *e*, and a store-room, *f*, adjoining, in which potatoes and other roots, flour, meal, barley, table-beer, &c., may be kept for sale to the occupiers. The common wash-house, *g*, is fitted up with washing-troughs, from *h* to *i*; and there is a pipe of hot water from the boiler in the kitchen, and another of cold water from a cistern over the wash-house; both which communicate by cocks with each trough. There is also a hole in the bottom of each trough, with a stopper, for emptying its contents into a common drain, connected with the cess-pool of the water-closets. There may be one of Siebe's pumps in the wash-house, where it would be completely protected from the frost; and by this, the water might be raised from a well, either in the floor of the wash-house, or at any convenient distance from it, to the cistern. This cistern would also be completely protected from the frost; and from it a pipe might be conducted along the upper part of the middle wall, which separates the sitting-rooms from the bed-rooms of the dwellings, so as to supply each house. Another pipe, with a ball cock, will give a perpetual supply to the hot-water boiler; from which the water may be drawn for the use of the kitchen by one cock, as it is in the wash-house by several. This boiler, intended for the purpose of affording a perpetual supply of hot water, should be raised considerably higher than the cooking boilers, in order to supply the water at a sufficient height for the washing-troughs; the floor of the washing-house being on a level with the floors of the dwellings, while that of the kitchen, as already observed, is four feet below them. Adjoining the wash-house is a drying-room, *k*, heated by the hottest part of the flues which proceed from the ovens, the open fireplace, and the boilers; and, to increase this heat, a part of the flues may be covered with cast-iron plates, over which may be a false floor, one inch distant from them, so contrived as to create a draught on the

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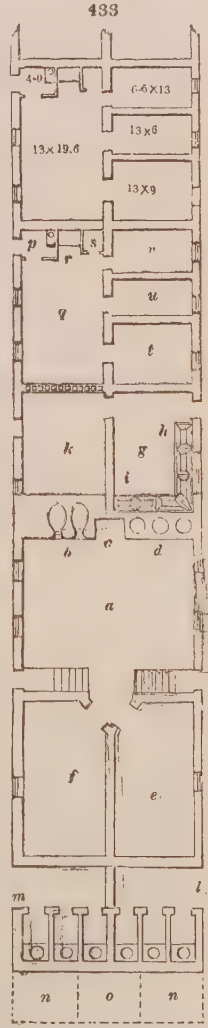

principle before mentioned, § 306. There are two divisions of privies; one for the females and young children, *l*; and the other for males, *m*. The drain, common to both, is connected with three covered cess-pools, *n*, *n*, and *o*; by which, with the aid of two sluices or plugs, as described in § 16, *s*, the liquid manure in one tank may be allowed to ferment, while one of the others is being filled, and the third being emptied. Over these cess-pools are two dung-pits, *n n*, and one pit for rubbish not convertible into manure, *o*.

488. *Accommodations of each Dwelling.* The entrance is by a lobby, *p*, in which there is a sink with a water-cock at one corner, and the other corner may do for the tools, brooms, &c. A door from this lobby opens into the living-room, *q*, which is of a commodious size, nineteen feet six inches by thirteen feet six inches. In this there is a place, *r*, with a raised hearth for keeping food or water hot over a lamp, a little charcoal, or a fire pail, there being a small flue formed of earthenware pipes, for carrying off the smoke. This cooking place, however, is only intended to be made use of in case of family sickness. Adjoining, there is a closet cupboard, *s*; and at the opposite end of the room there may be corner cupboards, a dresser, or any piece of furniture or kind of fitting up the occupier may prefer or find necessary. There are three bed-rooms, *t*, *u*, *v*, the largest for the master and mistress; and the centre one, *u*, having the window down to the floor, paneled below, and to open as a door. This door is to be considered as exclusively for the use of the females.

489. *The flues under the floors* will be six in number, going from the three boilers and the two ovens. We propose that the whole of these flues should be placed under the floors of the living-rooms, and that all of them should go from the drying-room in direct lines to the extreme end of the dwellings, each outgoing flue having a return flue alongside of it. There will thus be six outgoing and six return flues; which, covered with one-foot tiles, will serve as flooring to the whole of the living-rooms. In order to prevent the smoke from rising between the joints, narrow slips of slate must be laid under each; or, what would make a warmer floor, the whole should be covered with cement, or artificial stone composition. As heat will not be required under any of the floors during the summer season, except that of the drying-room, it is proposed to have all the upright flues in the party wall between the drying-room and the first dwelling, and to have two communications with each of these upright flues, one from the outgoing flue immediately under it, and the other from the return flue of the same outgoing flue. By having a damper in the first, the smoke might be either sent round the horizontal flues, for the purpose of heating the dwellings; or, when heat was not wanted, allowed to escape through the upright flues. These dampers will thus serve to regulate the heat supplied to the floors of the dwellings; and, in the end of spring and the beginning of autumn, when only a little heat is wanting, some of the dampers can be drawn out; while in winter, when a maximum of heat is required, they can all be pushed in. The dampers will also be useful when first lighting the fires in the mornings; because withdrawing them will create a draught. The number of dwellings, which it is supposed these flues might heat, with no other fuel than what was required for the cooking and washing of the occupants, is here estimated at twelve; but, if the houses were placed on a slope, the fires at the lower end, and the upright flues at the upper end; the outgoing horizontal flues having no returns, the number would no doubt be greater. Much will depend on the kind of fuel used, and on care being taken to let no air pass into the flues from the furnaces or ovens, that has not entered by the ash-pit doors, and ascended through the fires; and also, that, when no fires require to be made, the furnaces, ovens, and ash-pit doors are kept closely shut. The best fuel for heating flues is that which burns the quickest, such as faggot wood, spray, shavings, &c.; and when once heated they ought to be closely shut up, to prevent a draught of air from cooling them.

490. *Construction.* We have shown all the outside and party walls as eighteen inches thick, and the partition walls as one foot thick, on the supposition that it would be cheapest to build them in mud or rammed earth: there will thus be no brickwork required, but for the ovens, fireplaces, and flues. The walls may be finished inside according to the taste or means of the party. The roof may be of thatch, or whatever material is cheapest in the given locality; it ought to project at least three feet on every side, as well for protection of the walls, as to form a covering to the terrace path, which will form the common passage from all the dwellings to the offices; and also to save the expense of gutters. In the roof of each dwelling there should be an opening of two or three inches square over the raised hearth, corresponding with a similar one in the ceiling under it, to admit the escape of smoke, when a lamp, embers, or charcoal,

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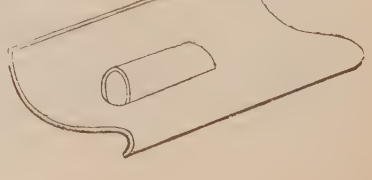

happened to be used in the heating place. The opening in the roof may be simply a pan-tile with a covered hole, fig. 434, such as are common in the neighbourhood of London. If thought necessary, a small flue to each cooking place could easily be made by earthenware tubes, ten inches or a foot in diameter, such as fig. 435, with a cap to keep off the rain, fig. 436. These tubes are common in all potteries, and are sold in the neighbourhood of London at only from ninepence to tenpence per foot. The same description of tubes, twelve or thirteen inches in diameter, may be used in forming the six upright flues to the six fires, which will thus render brickwork unnecessary for them, except at the dampers, and for the chimney shafts. All the window casements may be of iron, and all the doors ledged; and no window shutters can be required where there is perfect security, and abundance of heat. Warm curtains of some cheap worsted stuff in winter, and calico blinds in summer, will be found preferable. The privies are not proposed to be made water-closets; but to prevent the rising of smell, a description of cheap basin and trap may be used, such as fig. 437,

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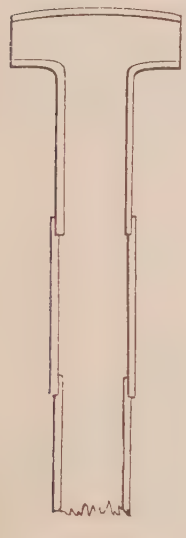

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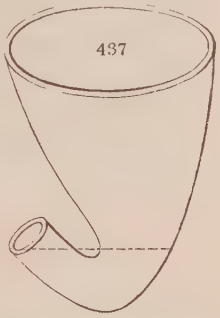

manufactured at the common tile potteries about London, and sold by retail at 2*s* 6*d*. each; or fig. 438, which has a hole for a water-pipe at *w*, and forms altogether a very complete trap; these are also made at the tile works, and are sold at 5*s*. each. It will be understood that the upper part, *x*, of fig. 438. is a separate vessel, of a funnel shape, and that the lower part, *y*, is a basin with a soil pipe, *z*; and that when the funnel is placed in this basin, it must be so adjusted as to have its truncated extremity reach to within two or three inches of the bottom. As this funnel, from its construction, must then necessarily remain immersed in water as high as the under part of the soil pipe or discharge tube, *z*, it is evident that no smell can rise through the funnel. When *x* has been properly adjusted to *y*, it must be made air-tight with cement.

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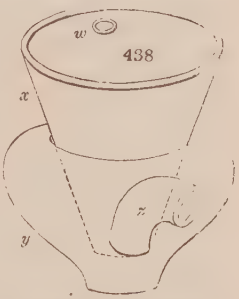

491. *General Estimate.* The cost of these dwellings will evidently depend much on the price of common country labour; for the work of the carpenter and joiner is very limited, and still more so that of the bricklayer. From a rough calculation made for us by an experienced surveyor, it appears that the whole of the twelve dwellings, with the requisite offices complete, as shown in the plan, might be executed, where common labourers' wages are 10*s*. a week, for about £500; which averages less than £50 a dwelling.

492. *Remarks.* Wherever this plan is proposed to be carried into execution, choice should be made of a dry soil, because that will greatly lessen the expense of the footings to the mud walls, to the flues, and to the platform. It must not be forgotten, also, that a level spot is to be preferred, unless one of a uniform slope is obtained, and the number of dwellings increased so as not to require the flues to be returned. We have no doubt that in many situations, perhaps in most, it would be least expensive to form all the flues of thirteen-inch tubes, so close together as to touch each other, supported on brick or stone piers, filling up the interstices above them, and levelling the surface so as to form a comfortable floor over them with concrete (gravel and mortar), and the flooring composition before mentioned, § 386. These, and every other description of flue in this position, the direction being straight, may be easily cleaned, which they ought to be at least four

times a year, by first pushing a slight line through them, by means of a series of hazel rods, or rods of any kind, tied one to another as inserted, and afterwards with this line introducing a rope, to which a bunch of straw is attached. Not one tile of any of the floors would require to be disturbed, but merely the ends of the flues opened, by taking out foot tiles, built in so as to be convenient for that purpose. The farther ends of all these flues will necessarily be on the outside of the gable end of the last dwelling, and the other ends will either form the throats of the ovens and furnaces, or they may terminate in the drying-room, close under the dampers, where their covering tiles may be taken up. It would save some trouble, if, when each flue was built, a copper wire were laid in it, extended from one end to the other. This might always be employed, when they were being swept, to draw through a rope. It may be thought that a line of buildings of this description, fig. 439, with no chimneys but in one place, would be rather

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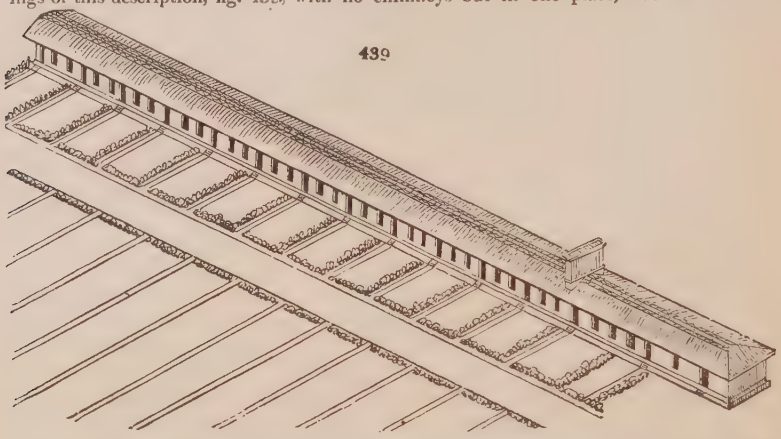

mean than ornamental; but that difficulty would be easily overcome, and would speedily be so, if such dwellings were found as comfortable and economical as we consider they would be. By employing tiles of any of the Italian forms for the roof, by heightening the architectural expression of the walls, and by surrounding the whole with a light zinc-roofed veranda supported by iron columns, the whole might be rendered elegant, as well as comfortable; not to speak of the additional beauty which might be given by ornamental shrubs and flowers, and by the gardens. In countries where grapes ripen in the open air, the whole roof might be covered with vines; and in colder climates, even apples, pears, cherries, or plum trees, might be trained over it in the same manner.

Design LXXX. — *Eighty Dwellings of the humblest Class, placed together, with a View of being heated by One common Fire, and enjoying other Benefits, on the Cooperative System.*

493. *General Purpose.* Our able contributors, Mr. Laxton and Mr. Taylor, have shown, § 290 and § 481, how six labourers' families may live together under one roof and use, in common, the same wash-house, oven, drying-closet, well, &c.; and we have, in both cases, suggested how the six dwellings may be heated from one fire. In our last Design, we have extended the idea of a common kitchen, wash-house, and other offices, to twelve dwellings, and shown how they might all be heated from the fires which must necessarily be kept in these offices, for cooking and washing. We now intend to show an extension of the principle, so as to include any number of dwellings, with common offices for cooking, washing, baking, brewing, bathing, &c.; and, instead of employing common smoke flues, as in our last Design, for heating the whole, to adopt, for that purpose, steam or hot water. Mankind are beginning to allow that society is in its infancy, and that "the grand secret of its improvement is in union and cooperation;" although, as the writer in the New Monthly Magazine, from whom these words are quoted, observes, Mr. Owen, the founder of the cooperative system, may be laughed at in the mean time by those who do not comprehend his doctrine. Our object, in giving this Design, is to show the application of the cooperative principle in what may be called a college of mud houses, for the humblest class of country labourers; by which it will appear, that, by such a plan, their comforts, compared to what they enjoy at present, even in the best districts of Britain, may be increased in an almost incredible degree. We shall not go very minutely into details; because we are aware that the labouring classes

themselves must be rendered alive to the benefits which would result to them from adopting plans of this kind, before they can be carried into execution with much prospect of success. Good, however, will result from making such plans known, because it will prepare the way for them in the minds of the rising generation.

494. *Locality.* The place where such an assemblage of buildings ought to be erected must depend on the kind of labour supplied by the occupants, and the demand for it. Such a Design as the present would answer best in the immediate neighbourhood of a large manufactory, or, in a mining district; or, in short, wherever mankind are employed in masses: but it would also answer for a central situation in an agricultural district, where the number of hands required was such, that none of the eighty men supposed to be here congregated together would require to walk more than a mile to and from their work morning and evening. In the neighbourhood of a large town like London, such a working man's college might be set down, though at a distance of several miles; because there is always abundance of public conveyances to carry the occupants to and from their work, and others might be started, either by individuals or by the college itself, to carry a greater number, and at a cheaper rate. In the best cultivated districts of Scotland, where the farms are large, it is the custom, during harvest, and we believe also during the turnip-hoeing season, to carry the labourers to the field and back again in carts; the same thing is also done with the colliers in the coal districts of Staffordshire, and has been lately adopted with the letter-carriers in London. Why, then, might not even an agricultural college, and much more a manufacturing or a mining one, support a public carriage for the accommodation of those of its inmates who had to go the greatest distance to their work? Such a college must always have a certain portion of land for the growth of culinary vegetables, &c., the culture of which would fill up all the spare time of the horses and their driver.

495. *Situation.* Whatever may be the locality of such working-man's college, the situation ought to be dry and elevated; and the summit of a regular knoll, or a level spot, will always be found preferable to an irregular surface, on account of the greater

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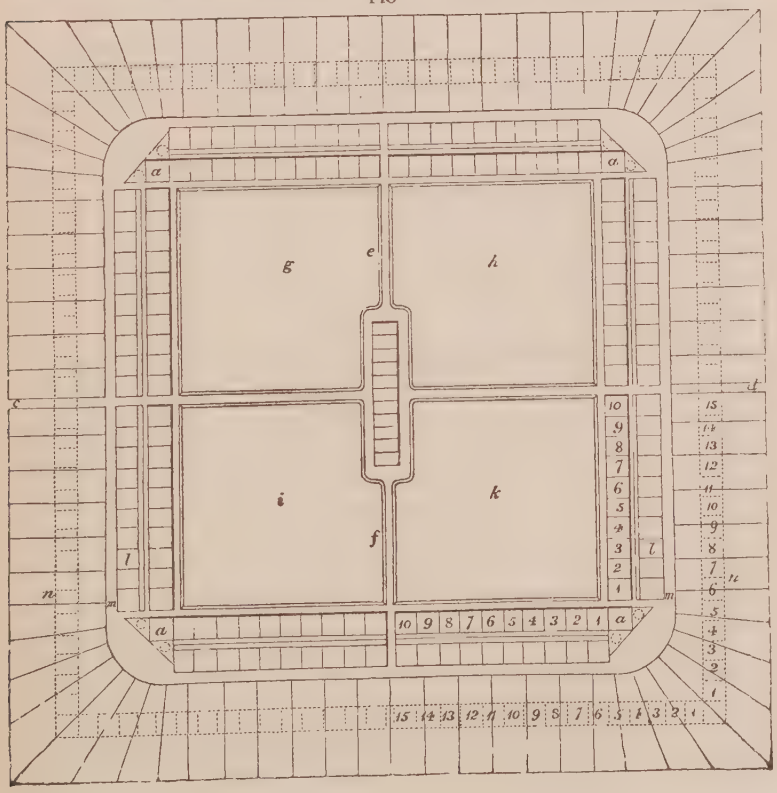

facilities which it affords for heating and supplying water to every separate dwelling. The aspect of this and of all similar buildings ought to be such as that the sun may shine on every front nearly every day in the year.

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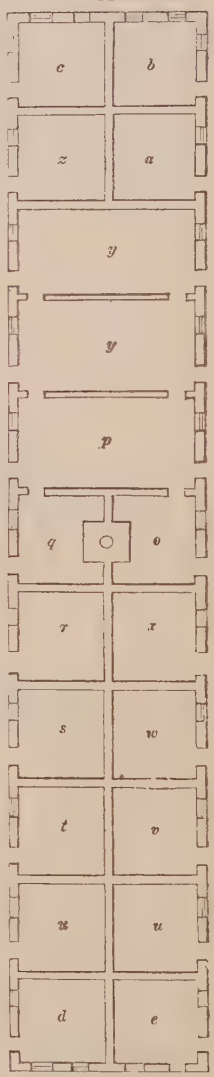


496. *General Form.* In all cases where economy is a leading object, the quadrangular form presents itself as the best. When the number of dwellings is few, as in Mr. Laxton's plan, fig. 267, or that of Mr. Taylor, fig. 424, or in a plan which we made in 1818, for a London college for working men (see *Mech. Mag.*, vol. xvi. p. 321), the whole of the buildings may be under one roof, and several floors may be formed one over another, and ascended to by stairs, or, as we proposed in the plan alluded to, by an inclined plane. In Design LXXX., however, we intend to have all the buildings only one story high, as cheapest, and as admitting of their being built of mud, or of compressed earth, chiefly by the occupants themselves.

497. *General Arrangement.* In the quadrangular plan, fig. 440, we have shown in the centre the public offices of the college, which include one fireplace, from which all the artificial heat required proceeds, and the public kitchen, store-rooms, dining-rooms, schools, &c. In the circumference we have placed eight lines of dwellings; every line containing ten dwellings marked 1 to 10, of four apartments in each, similarly arranged to the dwellings in the preceding Design. At the angles, *a a a a*, are water-closets; those entered from the inner side for the women and female children and infants, and those from the outer side for the men and boys. There is one carriage road, *c d*, which passes through the centre of the quadrangle, and two walks, *e* and *f*, which connect the centre with the circumference, at right angles with the carriage road. Both the central buildings and the outer quadrangle are raised on platforms; and the roof of the outer quadrangle is supposed to project at least three feet outwards from the walls, in order to give a dry path, at all times, along both sides of the dwellings. The four enclosed areas, *g*, *h*, *i*, *k*, may be devoted to public gardens and play-grounds. Exterior to the quadrangle, each dwelling is proposed to have a small grass plot or flower-garden, *l*, the width of its front, and about fifty feet in depth; beyond which there may be a circumferential walk, *m*; and, beyond that, gardens for fruit, flowers, and amusement, to each house, *n*. Last of all may come the vegetable ground, and dairy and poultry farm, belonging to the college, with its cow-house, stable, piggery, poultry-house, &c.

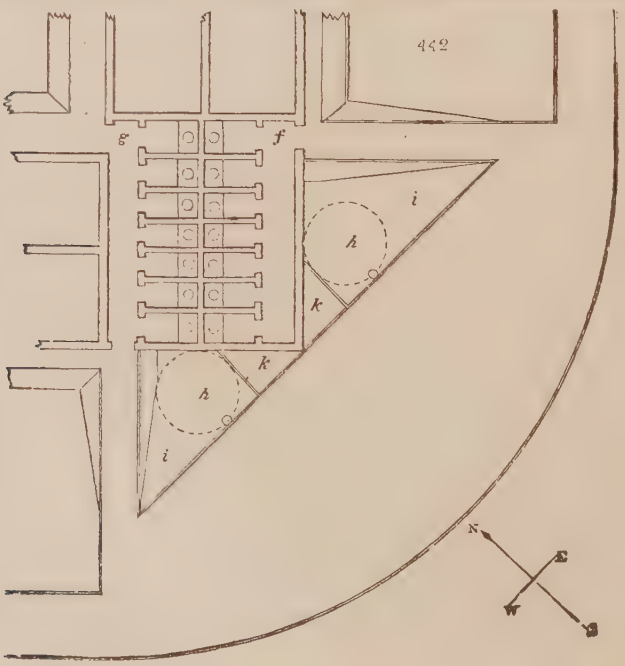
498. *Arrangement of the public Offices.* The most important of these is the fire and fuel room, fig. 441, *o*, in which all the artificial heat required either for cooking, washing, drying, &c., in the public offices, or for heating or cookery in the private dwellings, is generated; and from which it is distributed in the manner hereafter described. Adjoining this is the public kitchen and bakehouse, *p*, in which the roasting is supposed to be done in an oven, heated, of course, by the common fire in *o*; and in which there is also a baking oven, which may be either heated in a similar manner, or by Perkins's hot-water apparatus, which is connected with the common fire, and by which all the heat requisite for boiling, stewing, and similar culinary operations, is supposed to be supplied to the kitchen in small iron tubes of hot water and steam under compression, and raised to a temperature of from 300° to 400°. The same mode is proposed to be adopted for conveying heat to every public office and private dwelling. Adjoining the kitchen are, a scullery, *q*; dairy, *r*; larder and pantry, *s*; store-room, *t*; potato and root cellar, *u u*; brewhouse, with beer-cellar under, *v*; drying-room, *w*; wash-house, *x*; dining-rooms, *y y*; office for keeping the college accounts, and public library, *z*; infant school, *a*; boy's school, *b*; girl's school, *c*; bath for boys, *d*; and for girls, *e*. The mash tub may be in the upper part of the brewhouse, and the water may be boiled in it, by a pipe from Perkins's heating apparatus; from this the liquor may be let down into successive coolers, and working vats, till it is at last delivered by a funnel and pipe

to the different barrels in the cellar, as is done in the brewhouse of the Bush Inn, at Dudley. Adjoining the brewhouse is an apartment, *u*, with a cellar under it, for keeping potatoes and other roots; the upper part being devoted to fruits, herbs, and seeds. At this extremity of the building are the baths, &c. The two dining-rooms are each forty feet by twenty-five feet, which will afford space for two tables in each room four feet broad by twenty feet long; and these, with side-tables along the sides of the rooms, will dine 160 persons at once, in the two rooms. The entrance to these rooms is direct from the kitchen, and they are supposed to be surrounded by a sideboard shelf, one foot broad, above the dining-board, which may be two feet in breadth. The four detached tables are also supposed to have narrow elevated shelves, running along their centres, on which may be placed plates, and various articles, to which the party at table may help themselves, and thus lessen the labour of waiting. The tables may have a strip of iron along their margins immediately under the line of plates, and this iron may be easily kept hot during dinner by a very small pipe of hot water passing under it; thus preserving the food of each individual quite hot while being eaten. The office and public library, infant school, and the two Lancasterian schools for the older boys and girls, which, when not occupied by the children, may serve as lecture-rooms, places of public discussion, &c., may be heated by hot-water pipes from the common fire; as will the water in the baths, which it is supposed will be in use every day for washing the children. These bath rooms may, if requisite, be easily filled with steam, medicated or otherwise, for the benefit of rheumatic patients, and along their sides there may be long troughs, with forms beside them, for the larger children to sit on while washing their feet; and into these troughs hot or cold water may be admitted by cocks, and drawn off in the same manner by a waste pipe, which will convey it to the manure tanks. A similar process to this, for washing children's feet, is practised at Christ's Hospital, London. The chimney of the grand central fire may serve at the same time as a tower for a turret clock, which should have four faces, and be placed so high as to be seen from the inner windows of all the dwellings. It should be made to play chimes at certain hours, such as the time of rising, of taking meals, of going to school, &c. &c.; and at night the dials should be illuminated. In this tower there might also be a bell, for ringing on extraordinary occasions. In the fire house there may be a small two-horse power steam engine, which, by very simple machinery, may communicate with the kitchen, to work a kneading machine, a machine for chopping meat, breaking sugar, mashing potatoes, &c.; with the wash-house, to work the washing and wringing machine; with the scullery, for washing potatoes and other roots; with the knife and shoe house, for setting in motion a knife-cleaner (see *Mech. Mag.*, vol. ii. p. 409.), shoe-brusher (as at the Angel Inn, Oxford), a coat beater and brusher, &c.; with the drying-room, for working a mangle; with the dairy, for churning and breaking the curd of cheese, &c.; and, when employed in none of these offices, in turning a small bone-crusher, to prepare bones for making soup, and in raising water to a cistern over the scullery, placed on exactly the same level as the four cisterns placed over the four angular water-closets, and communicating with them in such a manner that there should always be the same depth of water in all the five cisterns. From the central cistern there should be pipes for conveying it to all the different offices, including even the dining-rooms and the schools; and to each cock there ought to be a small sink, communicating with a common drain leading to one of the four angular cess-pools. Many other modes of applying the power of the steam engine to domestic purposes will doubtless suggest themselves in practice. We have omitted to introduce a gasometer; because, though we believe that in towns gas might be advantageously employed for the purposes of cooking and heating, as well as lighting, yet, for a college of so humble a description, it might involve more expense and trouble than it would be desirable to incur. Neither do we consider the steam engine, nor the various machines which it is intended to set in motion, as at all essential to the plan; but we have suggested them, because, in many parts of the country, in the mining districts for example, the rate of wages is sufficiently high to allow of their introduction, and every one, in such districts, understands their management. The only feature in the way of apparatus, that is essentially necessary, is that of Perkins, for heating by hot water; and the reason why we consider this essential is, that it will convey to each of the eighty dwellings a higher degree of heat than can possibly be done by steam, and this at a cheaper rate, than by any other mode at present known. But if the idea of individuals ever cooking any thing for themselves in their own dwellings, or preserving any thing there at a higher temperature than 180°, is given up, which we think it very well might be, as the public kitchen is at a convenient distance for supplying hot water, &c., to all; then, instead of Perkins's apparatus for circulating hot water at a temperature of 300°, steam might be circulated at the ordinary temperature of 180° and upwards. The apparatus for this purpose would not be so cheap as that of Perkins, but it would be more easily put up, and kept in repair, in remote districts. In putting up a steam

apparatus, it must be kept in view, for the sake of economy, that all the mains may be of small half-inch pipe, which does not cost above 3*d.* or 4*d.* a foot, while the heating pipes under the floor of each dwelling, in order to give them abundant power, may be of six or eight inches in diameter. In the management of steam, with a view to economy, it should always be remembered, that it differs from water in this, that the mains may always be exceedingly small, however large may be the service pipes. Where steam is to be conveyed to a distance, this is a very great advantage.

499. *Arrangement of the Dwellings.* These, as before stated, are in eight divisions; by referring to the plan, fig. 440, it will be seen that the limits of each row of ten dwellings is determined by the carriage or foot entrance to the offices, at 10, at one end; and by the public water-closets, at *a*, at the other. We shall show, in succession, the mode of heating, and of supplying one of these divisions with water, the construction of the water-closets and manure tanks, and the drainage.

500. *For heating each line of Dwellings,* a steam or hot-water main proceeds direct from the central fire, to the end of the line, at 10. If steam be used, the main is there connected with two cast-iron pipes, the one under the floors of the living-rooms, six inches in diameter; and the other, under the floors of the bed-rooms, three inches in diameter. The main, and these pipes, must be laid with a gradual inclination from the boiler to the further extremity of the water-closets, which it also heats; and there each pipe must have a small return tube, gradually descending from that point to the boiler, to admit of the condensed water running back of itself. The mains, between the boiler and the dwellings, will be placed isolated within earthenware pipes; and these, and the return pipes of condensed water, will be included in a dry drain, filled with charcoal or coke. All the difference of level requisite to return the condensed water need not be more than one foot; so that, if this drain be two feet deep, the pipes will be sufficiently protected from the influence of frost. Under the floors of the dwellings, the drain need not be above ten inches broad and one foot deep, and it may be covered with one-foot tiles; or, the tubes may be made square, and their upper surface may serve as part of the floor, as suggested in fig. 282, for Laxton's small college, § 290; and also in § 489, for our college of twelve families. Should Perkins's hot-water apparatus be preferred to steam, common gas pipe may be used throughout, both for the mains and service pipes. A description of this mode of heating will be found in the *Repertory for Patent Inventions*, for March, 1832, and a more particular account in the *Gardener's Magazine*, vol. viii. p. 292, by Mr. Perkins himself. Should Mr. Perkins's apparatus be adopted, there



may, in the living-room of each dwelling, be what may be called a hot plate, connected with it; that is, a branch pipe may rise from the pipe in the floor, and terminate at top in a piece of cast iron, say of a foot or eighteen inches in diameter, like a small table, or like the raised hearths common in the kitchens abroad. The temperature of the upper surface of this table, when the apparatus was at work, would be between 250° and 300°; and, consequently, it would boil water, broil meat or fish, toast bread, and perform every office of cookery, with the exception of roasting. This table would be most conveniently placed in a closet or cupboard, which might correspond in situation with the ordinary fireplace of a kitchen, so that it could be shut up at pleasure, and especially during summer, when the heat escaping from it might render the room too warm. In the roof of this closet there should be an opening in the ceiling, communicating with the open air through the roof, by means of a tile or slate with a hole, as shown fig. 434, § 490, to permit the escape of steam and smell.

501. *Supply of Water.* From a cistern thirty feet long, and five or six feet broad, over the water-closets, a lead pipe should be conducted along the bottom of the same channel which contains the steam or hot-water pipe; and from this, in each house, a branch pipe may rise, and terminate in a cock over a sink, either in the cooking closet, or in the entrance lobby adjoining, as at *p*, in fig. 433. In order that this cold-water pipe may not receive any heat from the hot-water or steam pipe above it, it should be laid at least a foot deeper, and covered with soil.

502. *Water-closets, Manure Tanks, and Drainage.* The situation of these is at the four angles of the quadrangle; and each is arranged, as shown in fig. 442; in which *f* is the range of closets for women and infants, and *g* the range for men and boys: *h h* indicate the situations of two tanks communicating with the cesspool, common to both ranges of closets. By means of a hole, with a stopper, at one side of the roof of each tank, it may be emptied by one of Shalders's pumps. There are drains directly under all the channels containing the steam or hot-water service pipes and mains, which convey the waste water from the public offices, and from all the sinks of the private dwellings, as well as all the water which falls on the surface, in equal parts, to the four cesspools of the water-closets. Thus an immense quantity of liquid manure will be formed. Wherever the surface water is allowed to enter one of these drains, a stink-trap must be used, to prevent the rising of smell. Of these there are many sorts very cheap; one of terro-metallic earth, made by Peake before mentioned, is of great strength and durability, and costs only 9*d.*; another, fig. 443, made in the tile-works about London, and very suitable for the sides of gravel walks, as the top lifts off, to admit of cleaning out the sand or rubbish which may have lodged in the bottom of the trap, costs only 6*d.* Over and adjoining each manure tank there is a place, *i*, for rubbish convertible into manure; and another smaller space, *k*, for broken crockery, &c., and such other kinds of rubbish as can be only useful in repairing roads, filling up pits, or making drains.

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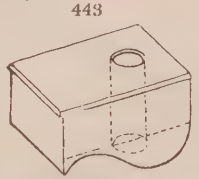

503. *The Plan of each Dwelling* we propose to be the same as that already detailed in fig. 433, § 487, for our smaller working-man's college, Design LXXIX.

504. *Construction of the Dwellings.* The walls and partitions of the whole of the private dwellings may be of earth, plastered over internally and lined, and coloured in imitation of stone externally. For this purpose the outside and party walls are shown eighteen inches in thickness, and the partition walls a foot. As no chimneys are required, and no second story, nothing can be more simple and economical than the construction of these walls. The floor may be formed of loose stones, gravel, or whatever material of the kind may be most conveniently had; and its upper surface may either be paved, or covered with a mixture of lime and gravel, mixed while the lime is yet hot, and spread out over the rough materials, and immediately beaten perfectly smooth. This mixture is called by London builders concrete, and, when covered with a thin coating of cement, forms an excellent flooring for either bed-rooms or sitting-rooms. The roof, as there is a central wall, need not be expensive; strong tie-beams may be dispensed with, by having the ceiling joists of somewhat larger dimensions than usual, so as to project three feet at the eaves; and by carrying up the central walls so as to serve as king-posts. The covering may be thatch, or whatever is cheapest; and unless the rain water be an object, there need be no gutters to the roof, as without them the water will drop on the slope of the terrace, which may be paved with pebbles, below which there may be a gutter, and under it a drain communicating with the main drains. The windows may be iron casements of the simplest kind, and without either inside or outside shutters; curtains, as before observed, § 490, where there is perfect security and an abundant supply of heat, forming a very good substitute.

505. *Construction of the public Offices.* All the walling, with the exception of that of the central chimney and clock turret, may be of earth. The chimney and tower must be built of stone or bricks. All the flooring may be formed in the same manner as that of the private dwellings. The baths may be simply square tanks, lined with Roman cement. The roof should project as in the private dwellings, as well for the protection of the walls, as to give a dry path completely round the whole, for the purpose of communicating from one door to another. Other details need not be entered into: the oven may be Hicks's patent one, described in the *Mech. Mag.*, vol. xiv. p. 417; the kneading machine, one of several also described in the same work; and the turret-clock may be of wood, a clock of that material being little more than half the price of one of metal (see *Mech. Mag.*, vol. iv. p. 142); the washing and wringing machine may be one manufactured by Weir, to be hereafter figured and described.

506. *General Estimate.* The expense of each dwelling, steam or hot-water pipe and cold-water pipe included, would, in most parts of the country, not exceed £50; and the expense of furniture to the occupier would evidently be less than in the case of single cottages; because vessels for cooking, baking, brewing, washing, &c., would be unnecessary. The expense of the greater number of the apartments, constituting the public offices, would be about the same, per cubic foot, as that of the private dwellings. The most expensive would be the fire-house and the kitchen. The different apparatus and machines would form a considerable item, because no part of the work connected with them could be done by the occupants themselves. Exclusive of the heating apparatus, and of the machines, and furniture of the public offices, the whole quadrangle might, in all probability, be completed for between £3000 and £4000; and £1000 more would supply all the machines, furniture, and fittings-up for the public offices.

507. *The general appearance* of such a working man's college as that we have just described will be simple, but not inelegant, as will be seen by the isometrical elevation, fig. 444. Much of the beauty and interest of the whole will depend on the keeping of

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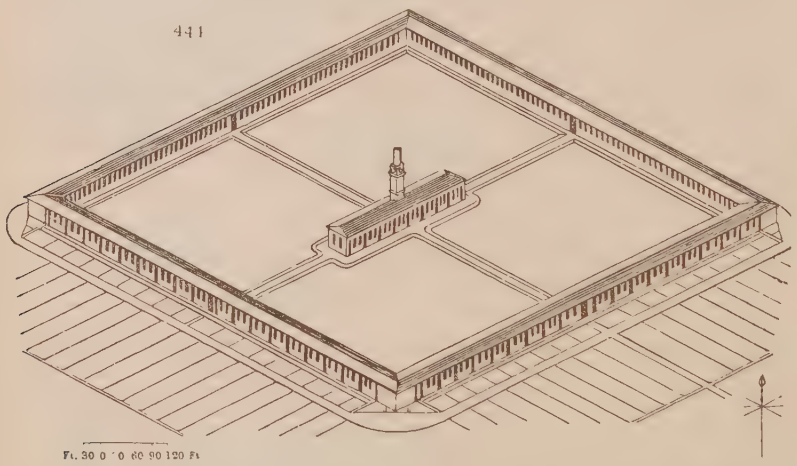

the gardens, and the cultivation of the farm; and much of the enjoyment of the occupants, on the building being placed on an elevated situation, commanding extensive prospects on all sides.

508. *Remarks.* Though we have recommended a quadrangle as the preferable form for a large working college in the country; yet there is no form which may not be adapted to this purpose, with advantages approaching more or less to those possessed by the quadrangle. One continued line along a road or river, up a steep hill, or across a slope, provided always that the floors of all the dwellings were in one plane, whether level or inclined, would answer perfectly. In such cases the general fire must always be placed at the lower end, and the general cistern for supplying cold water at the higher end, for obvious reasons. Even in a scattered village, if the floors of the houses were either nearly on one plane, or nearly on a level, they might all be heated from one fire; and their inhabitants might all have their cookery and washing performed in the same kitchen and laundry. Indeed, if Busby's mode of circulating hot water below the level of the boiler, by mechanical means, were adopted, the floors of all the houses might be heated, however different might be their levels. It would be easy to bring together double the

number of families in a quadrangle of the same dimensions as fig. 444, by diminishing the ground area of each dwelling one half, and raising a story over it, for completing the requisite accommodation. A second range of dwellings forty or fifty feet beyond the first, so as to form a double quadrangle, would give 120 additional dwellings of the same size and arrangement as those in fig. 440, making in all 200; and 400 might be obtained by having two stories. The situation of the dwellings of such an outer quadrangle is indicated by the dotted lines, marked one to fifteen, in fig. 440. The mode of having a double quadrangle would in general be much more economical than raising the buildings three or four stories high, and thus rendering a heating-pipe necessary for the living-rooms on the third story. In buildings of two stories, there would be no occasion for any other heating-pipe than that on the ground-floor; because the heat would readily ascend from that to the bed-rooms. If the occupants were to agree to dine at three separate hours, and to breakfast and sup in their own houses, no additional dining-rooms would be required; and the only alteration in the public offices would be an enlargement of the schools. Much more might be said on the subject of this Design, and on the immense advantages which would result from working men's colleges, to the labouring classes of every description; but the rising generation must be prepared for such a result by education. The first step towards living together in communities is being educated together in Infant and Lancasterian schools. In the mean time, those who have entered into the subject will be aware, that, by enlarging the separate dwellings, and using a superior description of materials and finishing in their construction, this plan might be rendered suitable for persons of any income; even so large as to require a set of stables and coach-houses, assembly rooms, a theatre, walled gardens, conservatories, hot-houses, pleasure grounds, and a park. The principle is the same in all,—that of producing in masses, by machinery, and by a division of labour, what has hitherto been effected in scattered fragments, by manual labour, and by every individual family for itself; and the advantages are, that by the cooperative system each member of the community obtains a much greater portion of comfort and enjoyment for a given sum or quantity of labour, than he could possibly have done singly. It would be foreign from this work to enter more fully into the subject, and we refer our readers to its enthusiastic advocate, Mr. Owen, and to an able exposition of the cooperative principle, as applicable to persons possessing from £500 to £1000 a year, given in the paper before referred to, in the *New Monthly Magazine* for August, 1832.

Design LXXXI. — *A Portable Cottage for the Use of Emigrants and others.*

509. *The principal object of this portable cottage* is, to supply emigrants with comfortable and secure lodgings immediately on their arrival at a foreign settlement. It is well known that in all new countries the rent of houses or lodgings is extremely high: it follows, therefore, that when an emigrant arrives with his family at the sea-port town of the country where he is to be put in possession of a grant of land, he must take a lodging for his family and goods; probably for some weeks, or even months, till he has visited the interior of the country, examined it, and fixed upon the situation of his future residence. A single room at Hobart Town, in 1830, was often let at £1 a week; hence it may be easily conceived that a portable cottage, like that given in this Design, which costs in London £50, will afford, though only containing two rooms, a considerable saving to a family of three or four persons of different sexes. Security from thieves, and protection from vermin, are also other recommendations.

510. *As secondary uses of a portable cottage*, we may mention, that it may be carried in ships making long voyages, for the purpose of being set up on shore wherever any stay is made, either for the benefit of invalids, or the use of scientific persons; that it may be employed as a shooting-box, wherever there are tolerable roads, as it weighs little more than a ton, and might therefore be easily drawn by one horse. (It weighs about three tons ship's measurement, which is forty cubic feet to a ton; but as a cubic foot of Baltic fir timber weighs only thirty-four pounds, even if the 140 feet forming the three ship's tons were solid, the weight would be little more than one hundred weight and a half. Not being solid, it is found not to weigh so much by half a hundred weight.) Where public works are going on in any remote district, one of these cottages would form a very convenient dwelling for the overseer; and, being put on six wheels, might be moved forward as the work proceeded. When that stupendous undertaking, Napoleon's road over the Simplon, was being executed, the chief engineer, a general of high rank, lived in a portable cottage, about ten feet square, which was carried forward by men, from one position to another, as required; and the remains of which we saw in 1819, at a village near to where the road commences in the Valais, on the Swiss side of the mountain. A party exploring a river in any country, and wishing to study the natural history of the country on each side, or even to shoot and fish, would, if they had such a

cottage in their boat with them, find it a source of great comfort, as it could be put up by a man and a boy in two hours, and taken down again in even less time.

511. *The Accommodation* of such a dwelling is limited to two rooms, as in fig. 445 (to

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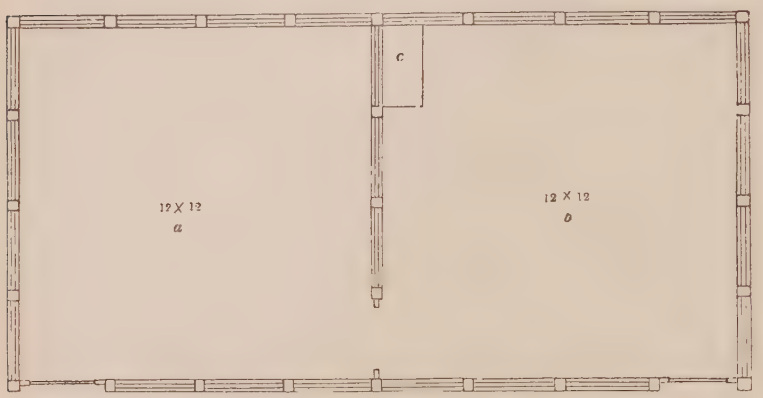

a scale of three inches and one eighth to twenty feet), each twelve feet by twelve feet, and eight feet high in the clear. One of the rooms may have an iron stove, *c*, at one corner; the pipe from which may be carried up within a square iron or wooden tube, with a vacuity of two or three inches between, in order to prevent the risk of setting fire to the tarpawling, which serves as the temporary roof. If necessary on account of cold, the stove might be placed in the partition between the two rooms, so as to heat both; or a tube from it might be carried round or along one side of either or both apartments. In general, however, horizontal pipes will be unnecessary, and one upright tube for carrying off the smoke will be found quite sufficient. The whole of the stove should be of wrought iron, for lightness.

512. *Construction.* The foundation of this structure consists of four sleepers, fig. 446,

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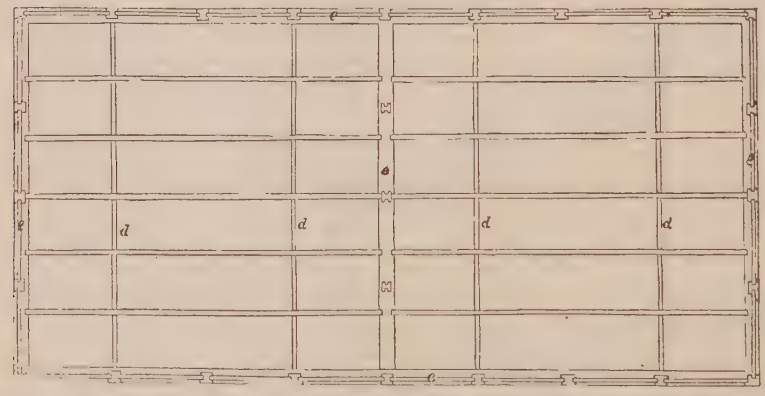

d d d d, each thirteen feet long, and five inches deep by three inches wide. On these are placed grooved bottom plates, *e e e e*, forming the foundations of the flooring, of the outside walls, and of the partition. These plates are formed of pieces, five inches broad, and three inches deep, laid flatwise, grooved along the upper side, to receive the bottom rails of the paneled frames which form the walls of the cottage. These plates are let into the sleepers in the manner shown by fig. 447 (to a scale of three eighths of an inch to an inch). In this figure, *f* is the sleeper; *g*, the bottom plate; *h*, the corner post let into it, in which is fixed a screw-nut, for being taken hold of by a screw-bolt that passes through the bottom plate so that by means of a bed-wrench applied at *i* it can be screwed perfectly tight. The corner posts are eight feet six inches long, and three inches by

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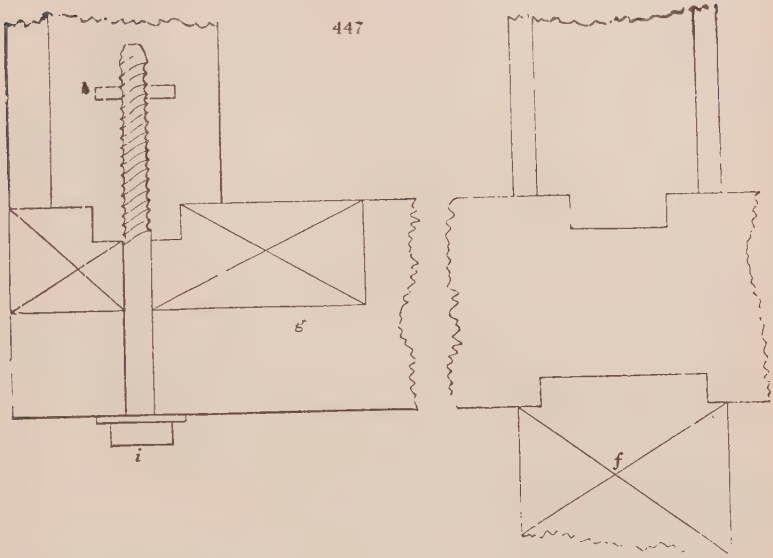

three inches on the sides. There are seven intermediate posts, and three posts in the partition, each of which is three inches and a half on one side, and two inches and a quarter on the other. There are five joists, each five inches by two inches, which are joggled on to the sleepers and to the bottom plate, as shown in fig. 448 (to a scale of

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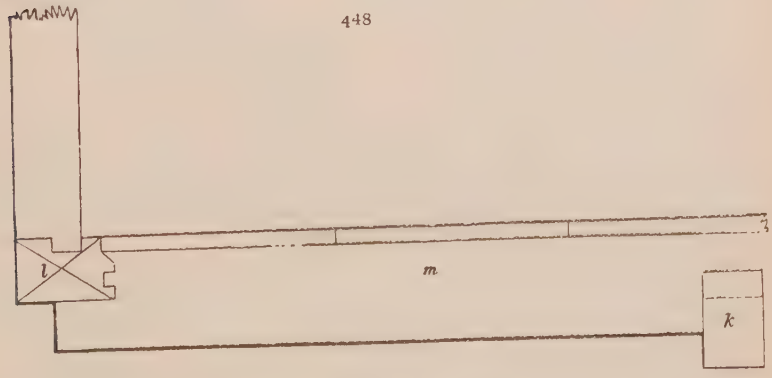

an inch and a quarter to a foot), in which *k* is the sleeper; *l*, the bottom plate; and *m*, the joist. The posts are grooved on the sides, and so are the top and bottom plates, for the purpose of receiving in the grooves the ends of the paneled frames. When the cottage is putting together, the paneled frames, fig. 449 (to a scale of an inch and five eighths to three feet), are put in between the grooved posts. Two of these panels are in part glazed, and hinged to a hanging style, which fits into the upright groove; thus forming at once all the doors and windows required. The panels being all fixed, a set of top plates is put on, similar in dimension to the bottom plates, and similarly grooved to receive the top rails of the paneled frames; and these are held together by iron screw-bolts at the corners, made fast by a bed-wrench applied on the upper side of the plates. On these top plates (which, in a common building, would be called the wall plates) are placed the rafters, seven feet six inches long, and four inches by one inch and a half

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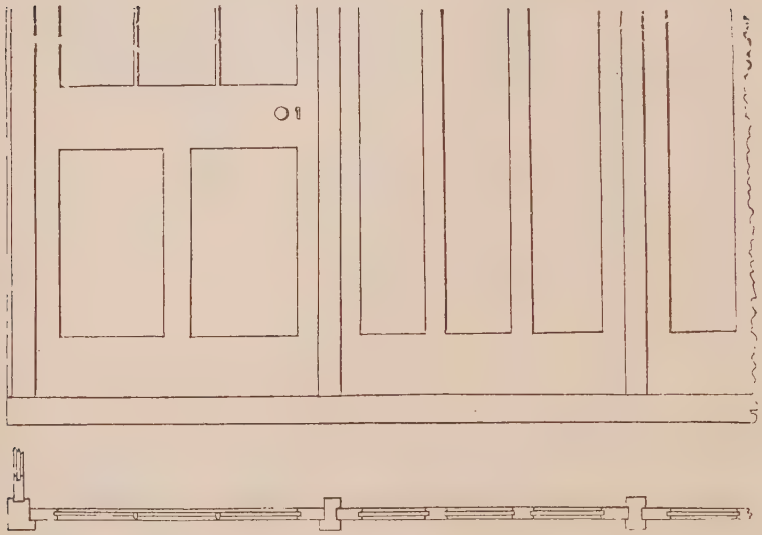

thick, which are let into a ridge piece at the top, as shown in fig. 450, and into the wall plates at the foot, as shown in fig. 451. A purlin is placed across the rafters on each

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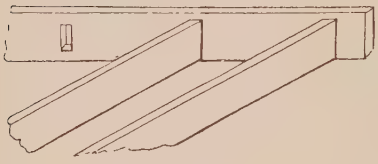

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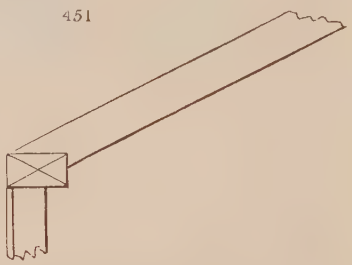

side, halved into them, and flush at top, as seen in the skeleton elevation, fig. 454. The flooring is formed of inch-deal boards, laid side by side, and let into the bottom plates, as shown in fig. 452 (to a scale of one eighth of an inch to a foot), in which *n* is the floor board; *o*, the bottom plate; *p*, the bottom rail of one of the paneled frames; and *q*, the joist. The construction of these frames will be understood by fig. 453 (to a scale of five eighths of an inch to a foot), in which *r r* are the styles; *s s*, the muntins, or muntings (from the French, *montant*, meaning the upright pieces between the side styles,

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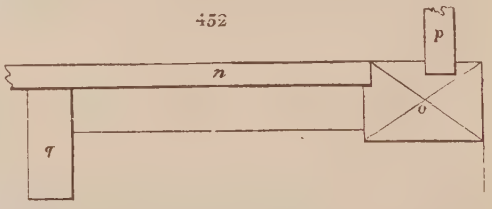

into which the rails of doors, or other paneled compartments, are framed); *t t t*, the panels; and *u u*, the posts. The outside posts, to which the partition is joined, are

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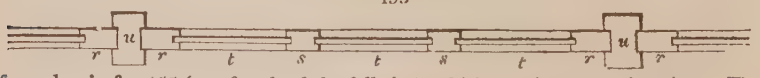

formed as in fig. 455 (one fourth of the full size), which requires no explanation. The roofing is generally completed by a tarpawling, which is thrown over the rafters, and

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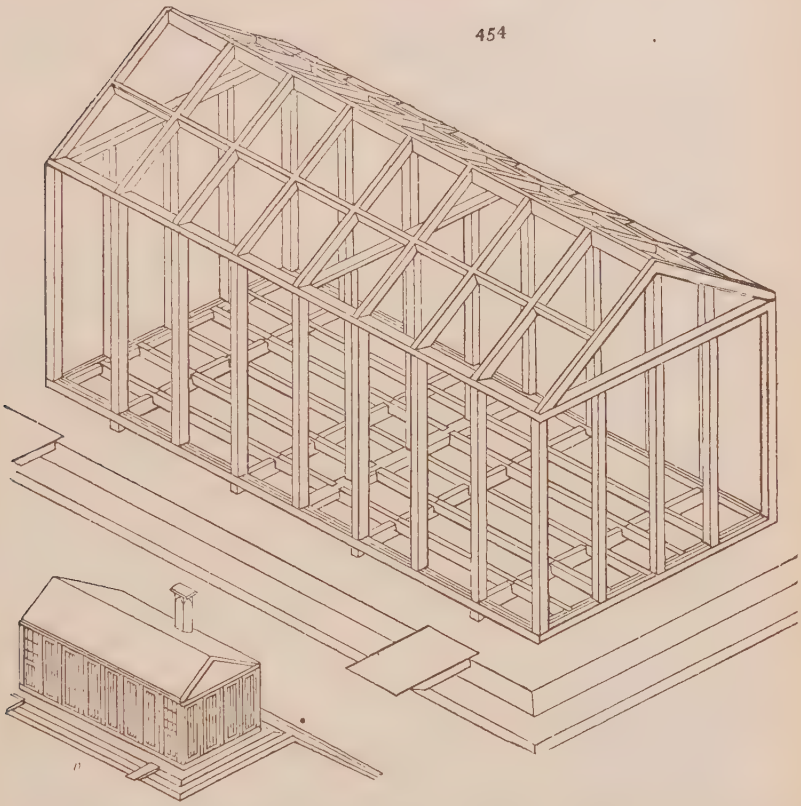
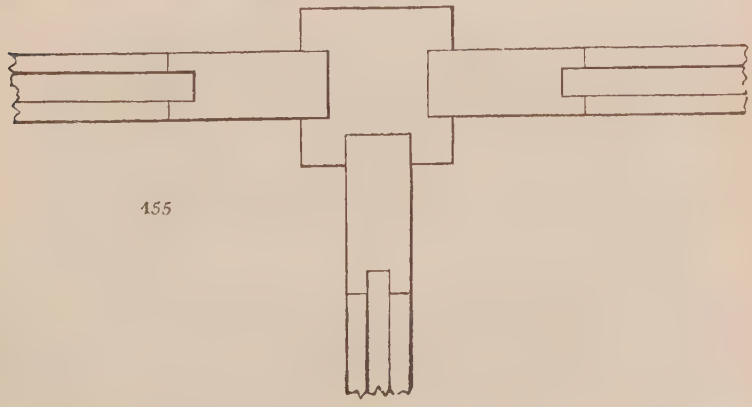


having strings on the under side, is made tight by them to the rafters, while it is kept close down at the eaves by lines which are sewed along the margin of the canvass, and tied tight at the angles. All that is now wanting to complete the cottage are eight short posts, on which to place the sleepers, so as to raise the floor above the surface, in order



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to keep it dry. These, however, may be generally dispensed with; for on very dry soils, or where the ground falls from the site on every side, the sleepers may be laid on the ground; and even in situations flat, and not very dry, a ditch may be dug round the

cottage, at the distance of about a foot from it, so as to produce the effect of placing it on a platform, as shown in the skeleton, fig. 454, and in the miniature elevation of the finished cottage, in isometrical perspective, *v*, in the same figure. Exterior appendages may be easily constructed of materials found on the spot. The tarpawling ought to be oiled, and all the wood-work should have at least two coats of paint. If instead of being painted with common oil paint, these cottages were coated over with any of the anticombustible paints or washes, the risk of accidents from fire might be diminished. The most effective wash of this description is said to be a saturated solution of silex in alkali. This is obtained by dissolving to saturation, in a lie of caustic alkali, siliceous earth properly prepared. Whatever material is washed with this mixture is said to become covered with a vitreous coat, and this has been proved at Munich and other places effectually to resist ignition. (*Rep. of Arts*, 2d series, vol. iii. p. 249.)

513. *Remarks.* We consider this cottage as one of the most perfect things of the kind that we have seen. Every part of it being made exactly of the same dimensions; that is, all the panels, posts, and plates, being respectively of exactly the same length, breadth, and thickness, no mistake or loss of time can occur in putting them together. Another great beauty in the construction is, that there is not a single nail used either in the carpentry of the separate parts, or in putting those parts together so as to form the cottage. All the framework composing the sides of the cottage being grooved and tongued, the weather is most effectually kept out; and at the same time this construction allows the work to shrink or swell, according to the changes of the atmosphere or the season, without deranging any of the parts. The inventor of this cottage, Mr. Manning, carpenter and builder, High Holborn, London, has made a great number of them for the Australian colonies, and particularly for the Swan River. Mr. Manning, who has a son settled at the latter colony, says, "These cottages were found to be of the greatest service to settlers, both in protecting their families from the weather, and their property from theft. Many persons who took out only tents, suffered severely in both respects; their tents being frequently blown down in the middle of a stormy night, and their goods being thus not only exposed to the weather, but to pilfering. Provided with a cottage of this description, an emigrant might land from a ship in a new country in the morning, and sleep in his own house on shore at night. Whoever can use a common bed-wrench can put this cottage up; and as none of the pieces are heavier than a man or a boy could easily carry for several miles, it might be taken even to a distance, without the aid of any beast of burthen. When a permanent situation is fixed upon, the cottage may be covered with shingles, or thatched with spray of trees, long grass, or such other suitable material as may be most readily obtained; and at any future period, when the emigrant is prepared to build a stone, brick, or earthen-walled house, all the posts, panels, &c., of the portable cottage may be brought into use as doors or partitions; or cut up for window-framing, shelves, chests, or a variety of other purposes; and the tarpawling, when no longer wanted for the roof, will always be a useful article for the agriculturist."

514. *A Portable Cottage may be used as a Substitute for a Country Residence.* Mr. Manning has furnished us with an elevation and ground-plan, figs. 456 and 457, of one, which he constructed for Captain J. G. Hall, and which has been erected by that gentlemen as a residence, at Wargrave, near Henley upon Thames. It is placed on a rising ground, within sixty feet of the river, and forms a handsome and conspicuous object to persons sailing from Henley towards Reading. The accommodations of this cottage are, an entrance hall, *a*; servant's sleeping-room, *b*; kitchen, *c*; store-room, *d*; sitting-room twelve feet square, *e*; and bed-room, *f*. A lumber-room which is formed in the roof

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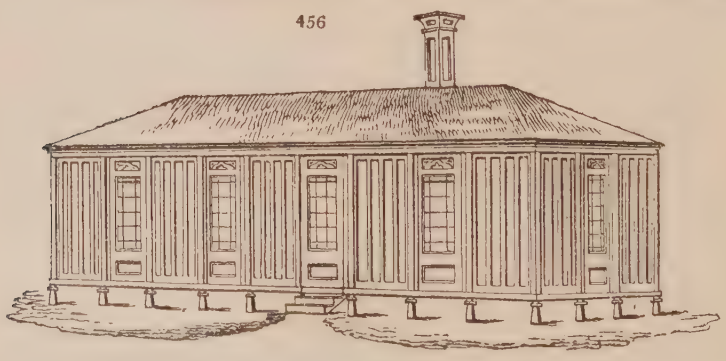

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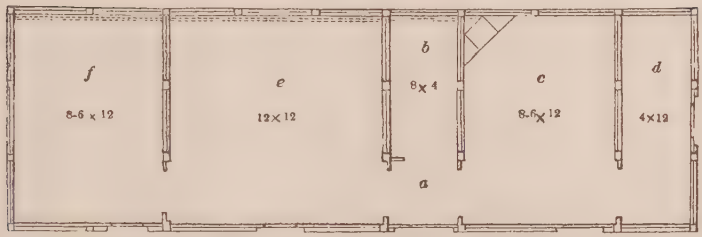


has a floor of ploughed and tongued boards laid on ceiling joists, so as to form a ceiling to the room below, and a floor to that above. The roof is thatched; and the walls are painted, and dusted over with powdered freestone. The interior is painted in imitation of wainscot. The fireplace of the sitting-room is a ship's cabin stove, and that of the kitchen a ship's galley stove; both having iron piping for flues. By having horizontal piping from the kitchen through the servant's room, sitting-room, and bed-room, with a return pipe, one fire might suffice to heat the whole house. In this case, by a very simple contrivance, the smoke, during warm weather, instead of circulating through the horizontal flues, might be made to escape direct from the fire through the upright pipe (see § 489.). The cost of this cottage in London, exclusive of the stoves and the thatch, was only £120. For this sum, which would do little more than pay for a year's lodging of two rooms and a kitchen, in a fashionable street in London or New York, we have here a handsome and comfortable dwelling, abundantly commodious for a single person, or a man and his wife without children, and which, with moderate attention to painting, would last a lifetime. It must not be forgotten that a great saving is produced by the paneled walls, which render unnecessary all expense of plastering and papering, and which, when painted in imitation of wainscot, look remarkably well, and remain many years without requiring any repair.

515. *Ambulatory Cottage.* With such a portable cottage as this on wheels, a man with £200 or £300 a year might enjoy in Britain as much rural beauty and variety, as would cost another with a fixed town and country residence as many thousands.

516. *Cooperative Ambulatory Cottages.* If a family or a party intended to live in portable cottages, renting a small field wherever they found it desirable to set them down; and to change their place of residence frequently, say to the north of England or Scotland during summer, and to the south during winter, the most convenient plan would be to have not more than two rooms in one cottage, or, perhaps, even one room might be found enough, as the wheels should be low, and under the floor. At every place of encampment, the cottages, or rooms, any number of which might belong to one family, might be placed in a line, with the kitchen at one end; from which a steam pipe might proceed to heat all the others, and also a pipe of cold water from a cistern over the ceiling of the kitchen, filled by one of Siebe's pumps, and a long leathern hose, from any neighbouring well or brook. The roof and the floor of one side of every cottage might project three feet beyond the wall; and, when all the cottages were placed close together with the projections alongside of each other, a covered passage or veranda would be formed the whole length of the line of cottages. There would be no difficulty in heating all the rooms by steam from one fire, or in supplying all the bed-rooms with water from one cistern. Every cottage should have its own pipes for these purposes; and those of one cottage could be connected with those of another by right and left-handed screws and coupling pieces, as in Perkins's tubes for circulating hot water under compression. In short, by some contrivance, many of the comforts of a fixed residence might be obtained in these portable and ambulatory cottages; and many of the enjoyments and advantages of society and of cooperation, by a number of them encamping together. We do not say that the same comforts and advantages would be obtained so economically as in a fixed locality; but for those who have no occupation, and derive a great part of their enjoyment from visiting different parts of the country; who like to live by turns among mountains, by the sea-shore, in a fertile valley, or in the suburbs of a large town; among the lakes of Cumberland and Westmoreland in summer, and in Devonshire or Cornwall during winter, we do say that an arrangement of this kind would procure those enjoyments for one tithe of what they now cost.

Chap. III.

Designs and Directions for Exterior and Interior Finishing, as connected with Furnishing, and for the Fittings-up, Fixtures, and Furniture of Cottage Dwellings.

517. *Exterior Finishing* is the term applied to stuccoing, roughcasting, and plastering; and to whitewashing, colouring, painting, and similar processes, for exterior walls, and timber-work. It also includes troughs, gutters to projecting roofs, rain-water pipes, exterior window shutters and window blinds; and the application of exterior ornaments, such as barge-boards, canopies, ornamental chimney-pots, balconies, verandas, vases, trelliswork, and a variety of similar appendages.

518. *By Interior Finishing* is here to be understood the covering of the walls with various materials, partly with a view to use, and partly to ornament; such as affixing cornices, whitewashing, colouring, painting, stenciling, papering, &c. Architects include under the term finishing, all such portions of the joiner's work as are fixed, after the ceilings, walls, &c., are plastered; also locks, bolts, bars, and springs, to shutters and doors; and water-closets, baths, chimney-pieces, &c.: but, in this portion of our work, we have thought it best to confine ourselves chiefly to such parts of finishing as have not before come under our review.

519. *By Fittings-up* are commonly implied the putting up of wooden closets; the fixing of shelves; of seats and basins in water-closets; of cisterns; and of pipes and cocks to supply the different parts of the house with water; the hanging of bells; and the putting up of such other articles in a house, as cannot be taken down without deranging in some way or other the finishing of the apartments.

520. *By Fixtures* are meant stoves, grates, boilers, coppers, dressers, and sometimes bookcases and corner cupboards; all of which are more or less fixed to the walls, and, like the fittings-up, cannot be taken down without, in some degree, injuring or disfiguring the apartment.

521. *Furniture* includes all the portable articles introduced into apartments, for the purpose of rendering them habitable, comfortable, and agreeable: such as seats of different kinds, tables, beds, carpets, and curtains; wardrobes, and other portable receptacles for clothes, books, &c.; musical instruments; and also ornaments, such as pictures, sculptures, curiosities, &c.

522. *These different departments of the art of completing a house* are not alike susceptible of being illustrated by designs, which cannot, for example, be made to include painting, colouring, papering, &c. For this reason we intend to blend some general directions with our graphical illustrations, deferring the details of the processes of the painter, plasterer, paperhanger, &c., till we treat of these arts in a subsequent part of the work.

523. *In all that relates to finishing and furnishing*, the artist must be directed by the same general principles as those which were his guide in designing the building. These principles are as much founded on reason in the one case as in the other. The first impression which we ought to receive from seeing a human dwelling at a distance is that it is such; and that it is suited for some particular class or description of family, mode of living, or state of civilisation. On a nearer view, the parts and finishing of the exterior, as they develope themselves, ought to convey to us some ideas of the taste of the occupant. As we enter the porch, these ideas ought to be confirmed by the continuation of the same general style of taste, enhanced in degree, because nearer to the eye and under the protection of a roof; and, as we proceed to the principal apartment, the train of ideas awakened ought to be maintained, and increased, till it arrives at its ultimatum in the room where the mistress of the house receives visits from her friends. This is the general result to which all finishing and furnishing is, or ought to be, directed; and it may be reduced to two principles, unity of style, and gradation of excellence. Unity of style should pervade both the exterior and the interior; and there ought to be a regular gradation in the labour and care employed, from the outside walls and exterior finishing and ornaments, to the most highly enriched apartment within. Another principle, subordinate to these two, is, that as every apartment in a house has, or ought to have, its particular use, so it should be characterised by some particular piece of furniture essential to that use; and that all the subordinate articles and ornaments in such apartments should have a reference, or be appropriate, to the principal one. Thus a kitchen is characterised by the grate or kitchen range; the dining-room, by the sideboard; the library, by the bookcase; the drawing-room, by the sofa; and so on: the subordinate furniture must always accord with the principal article. Thus, the kitchen range should be supported in character by the dresser and plate-rack; the sideboard, by the cellaret and massive dining-table; the bookcase, by reading and writing tables and desks; and the sofa, by chimney and pier glasses, and by various descriptions of seats,

some with cushions. Every apartment, therefore, on being entered, ought to display a marked character of use; as well as a particular character of style, with reference to its finishing and furnishing. Whenever any doubt is left in the mind of the spectator, as to the use of an apartment into which he is conducted, something in that apartment must as certainly be wrong, as when the exterior of a building conveys a false idea of its use, and a human dwelling is mistaken for a stable or a chapel. This principle must also be extended to the exterior of a dwelling, and the windows and walling of a drawing-room, or library, or other superior living-room, ought never to be liable to be mistaken for those of a bed-room or closet. At the same time that the nobler parts of a dwelling are to be rendered prominent features in its general aspect, the meaner parts are not to be rendered more mean, but should rather be raised in character, so as to harmonise with the rest, and to support the general expression of the whole. These principles are as applicable to the humblest cottage as to the most elegant villa; and we shall proceed to exemplify their application in the order of exterior finishing, interior finishing, fittings-up, fixtures, and furniture. We should premise, however, that some parts of the present chapter must necessarily seem to belong as much to ornamental as to plain cottages; because the two subjects are so intimately connected, that it is almost impossible to separate them; nor, indeed, with a view to the improvement of the cottager, is it desirable that this should be done.

524. *Previously to finishing either exteriors or interiors*, a sufficient time ought to be allowed for what is called the carcass, or general framework, of a building to be thoroughly dried and settled in every part. The time requisite for this purpose will depend on various circumstances; but chiefly on the thickness of the walls, and on the doors and windows being left unclosed. The maintenance of this ventilation, when the house is finished, will depend upon the judicious introduction of openings in the side walls under all the floors, and under the eaves of the roof, for the admission of a free current of air. As a general principle, it may be laid down, that provision ought to be made for a constant circulation of air in all the voids of a building; or, in other words, wherever air is admitted, it ought to maintain a circulation with the external air. A circulation between the roof of a house and the ceiling of the uppermost room is maintained by small openings directly under the eaves; or by very small windows, loopholes, or slits, in the gable ends. A circulation is promoted under the floors of the different stories of a house by the introduction of small iron gratings in the walls, communicating with the vacuities between the floors and the ceilings. When precautions of this kind are neglected, premature decay is too frequently the consequence. What is called the dry rot in timber, every builder knows, is brought on by the use of timber imperfectly seasoned in parts of buildings excluded by position, or by neglect of the means, from proper ventilation. Even in cottages of the humblest class, therefore, the walls ought to stand some months before being roughcast, or coloured outside, or plastered inside; and the timbers of the floors should remain still longer before they are covered with the flooring-boards above, and closed up by the ceilings below: when all the timber-work is put up, it ought to remain another period before it is painted; and in some parts of Britain, and in most parts of the Continent, this period extends to a year and upwards, even in cottages. Common plaster, on brick or stone walls, ought not to be whitewashed or coloured in less than a year; or, if on lath and plaster, six spring or summer months. Where oil colours are used, the stuccoed plaster requires, in ordinary cases, to dry for one or two years. When this is neglected, the water enclosed in the walls cannot escape by evaporation; and is therefore, by the swelling of the mortar, forced through the paint; entirely discolouring it in some places, and occasioning it to peel off in others.

525. *Provisions for all the exterior and interior finishing and all the fittings-up and fixtures* of a dwelling, however humble, ought to be made in building it. Among these provisions, the principal ones are, proper openings for pipes for bringing in or carrying off water; tubes for conducting bell wire; recesses, flues, and other openings, for such of the new modes of heating or ventilating as it may be proposed to adopt; and places for cupboard-closets, water-closets, cisterns, &c. &c. There is not much to be provided for in this way in cottages of the class now under consideration, but still enough to warrant our noticing the subject in this place.

Sect. I. *Designs and Directions for the Exterior Finishing of Cottage Dwellings.*

526. *Outside Plastering* includes stuccoing with the different kinds of cement; roughcasting, Scotch and English; and common lime and hair plastering, ornamental or otherwise. The principal purpose for which any of these processes is adopted on the outside walls of a cottage is, to keep them dry; and a secondary purpose is, to render them ornamental, either by imitating stone, or by producing a surface more curious or agreeable to the eye, than the rude materials concealed by it.

527. *The Cements for Stuccoing* are chiefly the Roman cement, of which there are two

kinds common in Britain, Parker's and Mulgrave's; the Puzzolano; the tarras; the gypsum; the mastic; Frost's cement; the metallic cement; and Bailey's composition. The first two, and the gypsum, possess in an eminent degree the power of setting almost instantaneously, either with or without an admixture of sand. Puzzolano earth, tarras, and Frost's cement are better calculated than the Roman cements to indurate with lime; because they do not set so quickly. A very hard and durable cement may be formed of stone lime recently burned, and, immediately after being slacked, mixed with clean, sharp sand. This about London is called Bailey's composition, and is packed dry in casks, and sent to any distance. The usual proportions are, three of sand to one of lime. Mastic is a calcareous cement, which consists of earth, and other substances almost insoluble in water, to which, when pulverised, are added any of the oxides of lead, and also a quantity of glass, or flint stones; the whole reduced to a fine powder, and intimately incorporated with any cheap vegetable oil. This is rather too expensive a cement for cottages; but it forms a better imitation of stone, especially of freestone, than any other, and has this great advantage over all the others, that, when put up into casks, it will keep without injury for any length of time. In general, wherever good fresh lime and clean sharp sand can be had, an excellent cement may be formed. Mr. Frost has proved that lime, even chalk-lime, burned in a close kiln, and cooled without coming in the slightest degree in contact with the atmosphere, will, when afterwards slacked, and mixed with sharp sand, set as rapidly as Roman cement, and this even under water. (*See the Specification of the Patent in the Repertory of Arts.*) In England, the scrapings of the public roads, where limestone or sandstone is the material employed, are found to serve as a substitute for sharp sand, provided care be taken to wash from them their finer earthy particles. But on the subject of cements we shall enter more at length in a future part of this work.

528. *The object of covering the outside of the walls of cottages with cement* is generally to imitate stone. In this imitation, care must be taken that the lines drawn do not represent stones of too large a size; that the shapes of the stones at the corners, and for the lintels and sills of doors and windows, be suited to their situations and uses; and that, in the regular courses, the joints alternate and show bond properly, as in regularly built stone buildings. A dwelling with the walls of brick will often be much improved in appearance by forming the string courses, the facings or architraves to the doors and windows, the corner stones, the cornices, the tablings, and especially the chimney-tops, of cement in imitation of stone. Where the cement used for either of these purposes is lime and sand, it will resemble stone with little or no colouring matter added; but where Roman cement, or Puzzolano, or tarras, is used, the colour, after being laid on, will be dark, and the cement must therefore be brought to a stone colour by washing it over with washes, composed in proportions of five ounces of copperas to every gallon of water, and as much fresh lime and cement (to which some add tallow), as will produce the colour required. The copperas, or sulphate of iron, oxidises with the atmosphere, and produces a reddish tinge. The forms of the stones, defined by the lines, should, some days afterwards, be touched with umber, ochres of different shades, and occasionally with vitriol; which colours, if laid on by a painter who knows how to imitate the tints of nature, will produce a harmonious effect. Oil colours should not be used on cement laid on walls in the open air for a year or more, till the water mixed up with it is either solidified or evaporated. When cement is once thoroughly dry, its hardness and durability is greatly increased by washing it over with any oily or greasy matter, with or without a mixture of colour incorporated. There are various lithic paints for covering cement, all of which are composed of oxide of lead, powdered glass or other vitrified matter, and the colour of the stone to be imitated, intimately mixed together, and beaten up with oil.

529. *Roughcasting*, or *Harling* as it is called in Scotland, is a mode of outside finishing well calculated to protect walls from the weather. It is not capable of such a high degree of beauty as a covering of cement, because a roughcast wall is only a plastered wall with a rough surface, instead of a smooth one; but then it is considerably cheaper than any description of stucco. It is much used for covering rubble stone walls and houses, in Scotland and Ireland. The following is the process: — Plaster the wall over with lime and hair-mortar; when this is dry, add another coat of the same material, laid on as smoothly and evenly as possible. As fast as this coat is finished, a second workman follows the other, with a pail of roughcast, which he throws on the new plastering. The materials for roughcasting are composed of fine gravel, reduced to a uniform size by sifting or screening, and with the earth washed cleanly out of it; this gravel is then mixed with pure newly slacked lime and water, till the whole is of the consistence of a semi-fluid: it is then forcibly thrown, or rather splashed, upon the wall with a large trowel, which the plasterer holds in his right hand, while in his left he has a common whitewash brush. With the former he dashes on the roughcast, and with the latter,

which he dips into the roughcast, he brushes and colours the mortar and roughcast that he has laid on, so as to make them, when finished and dry, appear of the same colour throughout.

530. *Another description of roughcast*, which may be called English, as the other may be called Scotch, consists in dashing the surface of the plaster, after being newly laid on, with clean gravel, pebbles, broken stones of any kind, broken earthenware, scoria, spars, burnt clay, or other materials of the like description, sifted or screened, so as to be of a uniform size. The effect of surfaces of this kind is good, and the process admits of producing very great variety in the external appearance of cottages. The sea-side pebbles are frequently used in this way on the sea-coast of Norfolk: by being forcibly thrown against the moist plaster, they penetrate into it, and render it very firm and durable. Sometimes, instead of the stones, or other matters, being broken to a small and uniform-sized gravel, they are pounded into a coarse sand, and this is dashed against the moist mortar. The effect is pleasing, but the strength and durability are not so great as in the other mode. In using small stones or gravel, it is desirable, for the sake of effect, previously to render the moist plaster as nearly as possible of the same colour as that of the materials to be thrown against it. It is also desirable that all corners, sills, lintels, and, in short, all vertical and horizontal bond, should be tinted of the same colour as the roughcasting.

531. *Common Lime and Hair Plastering ornamented* is to be seen on the outside of cottages in several parts of England. When the plaster is in a moist state, impressions are made on it in various ways, and by various articles. Lines are drawn with the trowel, straight, wavy, angular, intersecting, or irregular. Stripes, chequers, squares, circles, or trelliswork, are also imitated. Wickerwork is a very general subject of imitation; and this is produced by pressing a panel, generally a foot square, of neatly wrought wickerwork, against the plaster, while moist. It is evident that this description of ornament might be greatly extended and varied; and that, instead of the panel of wickerwork, wooden plates of patterns, such as those used by room paper-printers, might cover the cottage walls with hieroglyphics, with sculptures of various kinds, with imitations of natural objects, or with memorable or instructive sayings, or chronological facts.

532. *Cementing, Roughcasting, and Plastering*, as means of ornamenting the outsides of buildings, are dangerous processes in the hands of a builder who is without a cultivated architectural taste. Let our readers never forget that the outside of a house, or a wall of any kind, covered in every part with roughcast, or with plaster ornamented in any way, except being lined and coloured in imitation of stone, is a mere blank or negation in Architecture. Such a wall has no beauty, because it has no expression. It may not even be a wall, but a panoply of plastered lath, imposed upon us as a substitute. No wall is worthy of the name that does not bear on its face the nature and kind of its materials, and the manner of its construction; or, in other words, that does not display in its physiognomy the character of its anatomy. A house, the walls of which are covered with roughcast, or with plaster whitewashed or otherwise coloured, whatever may be the beauty or magnitude of its doors and windows, is no piece of Architecture; it is not even an imitation of Architecture; because the elements of all architectural productions are the stones or bricks of which edifices are composed. A wall or a house, therefore, that does not show, either in reality or in imitation, the materials of which its walls are composed, can have no pretensions to architectural expression. This expression can no more be produced with its full effect, without the indication of the constituent materials of the edifice, than a sentence can be printed without employing the letters of the alphabet. There is not a more important principle than this for the young Architect to bear constantly in mind, in the whole range of the science of Architecture. The rule to be derived from it, in the practice of the art, is, whenever cement is to be employed on the outside of a building, and not to be lined and coloured in imitation of stone, there must be the requisite vertical and horizontal bond, for the strength, stability, and durability of the structure, of brick or of stone; or, in minor buildings, of timber, or of projections or piers of cement, lined and coloured in imitation of stone. The same rule applies to roughcasting and ornamental plastering. We shall illustrate this rule by the case of a plastered and whitewashed house, taken at random from a number seen from the window of the room in which we now write. Fig. 458 will, by general observers, be considered a very neat elevation; but those who have understood the principles we have laid down will see at once that it is totally without expression, having no appearance whatever of either vertical or horizontal bond. The facings to the windows convey the idea that these openings are surrounded by stone; but there is no evidence that these stone framings rest on any thing but plaster; the mind, therefore, does not follow up the impression made by the eye, and the imitation stone facings, for want of imitation support below them to carry on the illusion, sink into mere plaster ornaments. Let the plaster in front of this building be disposed either as in figs. 459 or 460, and how dif-

458 459 460

ferent would be the effect! In the first case, fig. 459, the vertical bond is produced, or, in other words, the roof is supported, by the squared stones at the angles, and the hewn stones forming the piers containing the windows; and in the latter case, fig. 460, the roof is supported by the pilasters, and the architrave over them; while the windows are supported by the string courses, or horizontal bond.

533. *Whitewashing* the outside walls of buildings is of very universal use, and it seems to please the eyes of persons of ordinary minds, by the contrast which it produces with the surrounding scenery. Bright whitewashing, however, has at all times been objected to by men of taste; particularly by artists, who, having cultivated the art of seeing objects with reference to their picturesque beauty, ought to be judges of its effect in scenery. Gilpin, speaking of the cottages in Wales, says, the Welsh generally "seem fond of whitening their houses, which gives them a disagreeable glare. A speck of white is often beautiful; but white in profusion is, of all tints, the most inharmonious. A white seat at the corner of a wood, or a few white cattle grazing in a meadow, enliven a scene, perhaps, more than if the seat or the cattle had been of any other colour: they have meaning and effect. But a front and two staring wings; an extent of rails; a huge Chinese bridge; the tower of a church; and a variety of other large objects, which we often see daubed over with white, make a disagreeable appearance, and unite ill with the general simplicity of nature's colouring. In animadverting, however, on white objects, I would only censure the mere raw tint. It may be easily corrected, and turned into stone colours of various hues; which, though light, if not too light, may often have a good effect." (*Gilpin's Wye*, p. 94.) Bartell directs, that, in colouring cottage walls, "every material of a strong harsh colour should be rejected. The fierce red of some kinds of bricks, and the perfect white of a wash of lime, are equally disgusting." (*Hints for Picturesque Improvement for Ornamental Cottages*, p. 10.)

534. *The Compositions for Exterior Colouring* are various. The following is said to be a very superior one: — Take 26 pounds of quicklime, slacked to a powder, and well sifted, and 28 pounds of tarras, sifted well. Mix these with a small quantity of water as quickly as possible. Beat them together with a wooden beater, upon a banker (a stone or wooden bench). Continue to beat them three or four times a day, for four days; and, at the end of that period, take three gallons of bullock's blood (which should be well stirred in the catching, to prevent it clotting), and add to it, when cold, three gallons of water. Put the lime and tarras into a tub, together with the blood and water, stirring them well to make the wash thin; when it will be fit for use. Keep stirring while using it, to prevent the tarras from settling at the bottom. Let the wall be first cleaned from moss and dirt, washing it twice with a watering-pot; and, before it is dry, begin to lay on the composition, observing not to work it too thick. In the second washing, add two quarts more blood, properly stirred while cooling, as before, to make the wash more sizy and glutinous. If a yellow tinge be desired, put in a pound or more of stone or Roman ochre, according to fancy. Stale milk may be substituted for blood, though it is said by some not to make the wash resist the weather equally well.

535. *The common colouring* in use about London is composed of whitening made from chalk or other lime, charcoal, or yellow ochre, and copperas, in proportions according to the colours which it is desired should prevail. A preponderance of lampblack, or powdered charcoal produces a greyish white, which is a cold, and not in general a desirable, colour; lime and stone ochre produce a cream or freestone colour. Lime and copperas produce a bright white at first, which, in the course of a few weeks, changes to a white, with more or less of a reddish tinge, according to the proportion of copperas introduced.

536. *A whitewash which will adhere to woodwork*, and preserve it from the weather, is thus composed: — To three parts of unslacked lime add two of wood ashes, and one of fine sand, or of coal ashes sifted through a fine sieve. Let these be mixed with as much linseed oil as will bring the mixture to a consistence for working with a painter's brush. If the mixture be ground together, it will be an improvement. Two coats will be required; the first thin, and the second thick. The hardness of this wash increases by time. (*Smith's Art of House-Painting*, p. 56.)

537. *The colouring of outside walls* is most commonly effected by water colours, when the surface of the wall is new; or by colours incorporated with glutinous substances or oils, after the walls have been thoroughly dried. As a general rule in colouring walls, it may be laid down, that colours unmixed with glutinous bodies, and held in solution by water alone, may be laid on the wall at any time when the temperature is ten or twelve degrees above the freezing point, and in no immediate danger of falling lower, whether the walls are wet or dry, new or old. Colours mixed with glutinous matters or oils, on the other hand, should not be laid on new walls till they are thoroughly dried; or on old walls at a season of the year when their surface may be saturated with moisture. The reason for these rules is, that water colours do not impede the evaporation of moisture from the wall, and the absorption by the mortar of carbonic acid gas, by which it is hardened and rendered durable; while glutinous colours, by closing up the pores of the surface, do both.

538. *Water colours for outside walls* are generally formed on a basis of quicklime, Roman cement, tarras, or Puzzolano. With one or other of these the colours are mixed as wanted, and are immediately laid on with a whitewashing brush. By far the most favourable time to do this is when the wall is newly built, or the plaster is recently laid on. In the case of old walls, they must first be thoroughly scraped, washed, and stopped; and afterwards brushed over with the colouring mixture, either as a flat shade, or clouded, as the expression is, to imitate the effects of time. This last purpose will be materially aided by taking any strong acid that combines with lime, or any metallic oxide, that will, of course, absorb oxygen from the atmosphere, and mixing these with water, in two separate pails, occasionally dipping the brush in one or the other. A very convenient acid is the sulphuric, in the proportion of one to ten of water; and a suitable oxide is the sulphate of iron, dissolved in water, in about the same proportion. The blotches moistened with the sulphuric acid will in time assume a rich cream colour, and those touched by the copperas will have a reddish tinge.

539. *Glutinous colours for outside walls* also take for their basis quicklime or some cement; and the glutinous matter is either blood, kept stirring till cold, to prevent it from becoming clotted, stale milk, or vegetable oils. Size and paste are sometimes used as glutinous media; and, in such cases, alum is mixed with them, to prevent them from fermenting, and becoming mouldy on the walls; but they are not durable, and, if exposed to driving rains, soon wash off. The desired colours are added to the glutinous matter, which is laid on of such a consistence as to part easily from a common whitewasher's brush.

540. *Painting the outsides of walls in oil colours* is too expensive for cottages, and, on the whole, is unsuitable for any structure not formed of timber. As a medium of giving colour, it is more expensive, and not much more efficient, than glutinous colours formed with blood; and, as a protection from the weather, three coats of oil paint are nearly as expensive, and far less effective, than one coat of quicklime and sharp sand, which will last as long as the atmosphere contains oxygen, and will grow harder as it grows older. In the United States of America, however, the exteriors of brick houses are said to be frequently "painted in oil, the colours being most commonly red or brown." It is also said that "the Dutch very generally cover their buildings with a composition of mortar, or plaster, mixed with oil and colour: blue, red or light pink, and grey, are the most common tints. These walls, when dry, have a kind of gloss like varnish, and of course resist wet." (*Mech. Mag.*, vol. iv. p. 98.) It appears to us that the protection afforded by this oil-colouring is not sufficient to atone for the bad taste which it displays.

541. *The kinds of colours most suitable for exterior walls* should generally be such as belong to the stones or bricks of the country in which the dwelling stands. These are chiefly whites, browns, yellows, reds, and greys. Yellow, red, and brown ochres are among the cheapest of colours; and from these, with whiting, charcoal, and bistre (or soot, from which bistre is made), all the colouring desirable for the outsides of cottages may be produced.

542. *Splashing* is a mode of colouring walls, which may be performed with equal success, as far as immediate effect is concerned, in water, in glutinous, or in oil, colours; and, in regard to the state of the walls, the same rules will apply in this case that have been already laid down in § 537. The object of splashing is either to imitate the lichens and weather stains of an old wall, or some particular kind of stone. It is seldom attempted in water colours, from their transient duration in the open air, but answers perfectly well with colours mixed with either blood, milk, or oil. The surface of the wall to be splashed must be well seasoned, and perfectly dry; and should resemble, as much as possible, the form of the stone or wall to be imitated; and the prevailing or groundwork colour of that wall should be given to it, by one coat over the whole. Then, several pots of different colours being mixed up, and a long painter's brush, called a duster, being put in each, the artist, holding a short stick in one hand, takes in the

other the brush, with the colour which he thinks it desirable to put on first, and strikes the head of the brush against the stick, so as to bespatter the wall with the colour. The taste of the artist must be his guide, as to the quantity of each colour which he throws on, and also as to the number of colours to be employed; but in neither case will he be at any loss, if he keeps the object to be imitated steadily in view. The first brushful of colour falls on the wall in circular patches, from $\frac{1}{16}$ to $\frac{1}{8}$ of an inch in diameter; the second brushful adds to the number of these round patches, and enlarges many of them, either by falling thickly among several, and joining them into one irregular blotch; or by falling on two or three, or on only one of the previous spots, and forming with it either an oval, or the figure 8. If we suppose the same process continued, on the same portion of surface, with different colours, it will be evident, that not only the shapes of the patches will be further altered by the addition of each splash of colour, but that their colours also will be varied. In this manner the process of splashing is carried on; and the result is obtained partly by chance, though chiefly by the skill of the artist. This kind of painting is less applicable to cottages than it is to imitations of rocks in garden scenery, and to Gothic buildings of a considerable size. In cottages, however, it may sometimes be usefully employed in colouring the imitations of stone or brick bond, where the rest of the walling is stuccoed, roughcast, or plastered; and, at all events, it is good to know every source of varied expression.

543. *In whitewashing, colouring, or painting the exterior walls of buildings*, the young Architect must constantly bear in mind that there are two objects in view; viz., the protection of the wall from the weather, and the production of a colour suitable to the object coloured, and agreeable to the eye. The protection of the wall is effected with glutinous or oil paints, by excluding it from all kinds of atmospherical influence, except that of change of temperature. The same object, but in a less degree, is produced by washes composed of lime or cement; which, while they do not prevent the atmosphere from evaporating the moisture of the wall in dry warm weather, yet exclude from its surface driving rains. The colouring matter in either of these cases is of very little consequence, so far as respects the protection of the wall. By having a clear idea of the purposes to be effected by colouring and painting, the Architect will know when to direct, or the cottager when to employ, colours or washes which will protect the wall from the drying influence of the atmosphere; and when such other colours and washes as will admit that influence ought to be preferred.

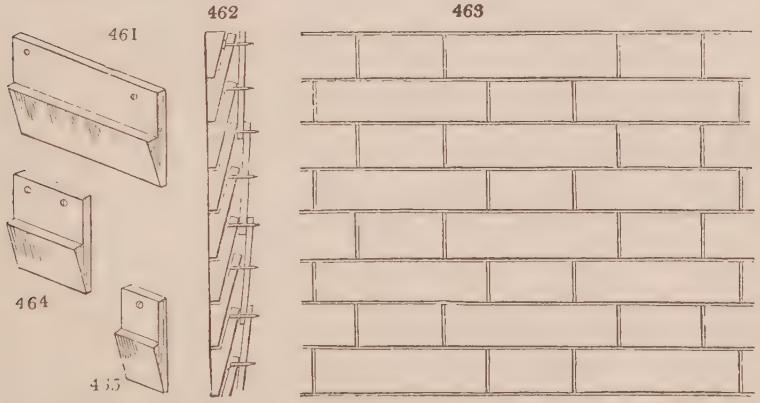
544. *On painting the woodwork of the outsides of cottages* little need here be said. If the wood be not thoroughly seasoned, it should not be painted with oil colours till it become so. It may be washed over in the mean time with water colours, or stained with nitrous acid, and dyed with logwood for immediate effect. We allude chiefly to the doors and windows. The larger outside timbers in cottages, especially those built of studwork and nogging, in countries where labour is abundant and paint dear, may be charred by the application of fire before being put up. We have seen buildings, the timbers of which had been treated in this manner, in France and Germany; and in Switzerland we have seen cottages in which the timbers had been charred, after having been put up, by the application of red-hot iron. The practice is not uncommon in some parts of Russia, not with a view to preservation, but for the purpose of ornamenting the very curious barge boards and gable ends which are sometimes seen on the cottages of enfranchised serfs in that country. The cheapest paint for the outside timber-work of common cottages in Britain is coal tar or gas liquor, which should be laid on hot during summer, when the timber is not only dry, but warm, and of which two or more coats, at intervals of two or three weeks, should be given, according to the nature of the timber, so as completely to saturate its pores. The colour cannot be called beautiful at first, but in the course of a year or two it assumes a subdued greyish tone, from the surface fibres of the wood becoming bleached by the atmosphere. Coal tar will, however, be sufficiently softened by the heat of the sun, to stick to clothes, or any thing that touches it, for three years; but is an excellent preserver where it can be used without inconvenience.

545. *The tiles, slates, and other roofing materials of cottages*, may be painted exactly in the same manner as the walls; but this can only be desirable with certain materials of a perishable nature, such as timber; or with others of a harsh glaring colour, such as red tiles. The latter will be greatly improved, both in durability and appearance, by being rubbed over or soaked in any greasy or oily matter, or by being painted with tar or gas liquor, before being put on the roof. But the best mode of colouring tiles and bricks is by mixing chalk, or ochres, or other oxides, with the clay, while it is being prepared for the mould. The tiled roofs of cottage lodges are sometimes splashed with oil colour, and the effect of age very successfully produced.

546. *The best description of paint, for all kinds of outside work*, is such as is formed by ground glass bottles, scoria from lead-works, burnt oyster-shells, and the required

colouring matter, powdered, and intimately mixed with raw linseed oil. Paint of this kind is prepared in London, and sold in a state of powder, under the name of anti-corrosion, lithic paint, &c.: but, as it requires to be mixed a day or more before it is used, as it is much more laborious to put on than common paint, as it wears out the brushes in a very short time, and, above all, as it lasts so long when applied to iron, or well-seasoned timber, or masonry, as seldom to require renewal during a man's lifetime, painters very seldom recommend it. The appearance of a surface painted with anti-corrosion is rough, resembling that of unrubbed cast iron or freestone; and, when timber which has been once painted with it has to be cut up by a carpenter, it takes the edge off his tools (even his axe and saw), so that he also is against it. It is used, however, in some government works; particularly for cast-iron bridges.

547. *The Walls of Cottages may be protected and ornamented by Mathematical Tiling.* The object of this is to make the walls appear as if they were built of brick. The tiles, fig. 461, have their surfaces in two planes; each plane of the depth and length of a common brick; so that when tiles of this kind are placed against a wall, the one overlaps the other, as shown in the section, fig. 462; and the general appearance of the elevation is that of regular brickwork, as in fig. 463. There are bats or headers to imitate half bricks, fig. 464; and closers or quarter bricks, fig. 465, for the purpose of breaking



joint at the angles, and rendering the imitation more complete. When these tiles are of cream colour, their effect is very neat, clean, and handsome; but buildings in which they are used, to be in good architectural expression, ought always to have vertical bond in the form of projecting piers or angle stones.

548. *Mathematical and common weather tiles may be rendered ornamental,* either by varying their outline, or by impressing on them, in the mould, lines or figures. This has been done in a few places in England with bricks, and we think also with tiles. Fig. 466 shows some forms of weather-tiling, in addition to those before given, § 459.

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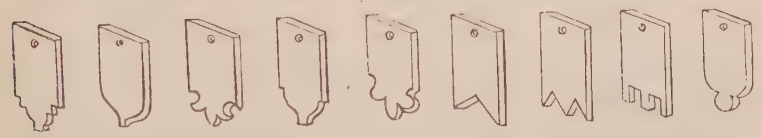

By taking leaves of plants as the source for originating ideas for varying the outline, the variety of ornamental weather-tiling might be carried to a great extent; and we are informed by travellers that it would be a most valuable protection to the wooden walls of houses in America, as we are certain it would be to the earthen walls of the farm buildings which are put up in some parts of Ireland. Weather tiles might also be applied instead of barge boards, the tiles in that case being formed longer; and, when put on at right angles to the slope of the gable, finished by a projecting line of plain tiles over them. The colour of common weather-tiling might be varied, as well as the form, by the mixture of chalk, ochres, &c., with the clay while working it. Mathematical tiling might be ornamented on the surface by geometrical lines and figures; by

representations of natural objects, such as the sun, moon, and stars, as is sometimes done on the window-facings and barge-boards of the cottages in Russia; of animals; of the flowers of plants; of their leaves, &c. In fig. 467 *a*, *b*, *c*, *d*, and *e* show a few of the simpler patterns.

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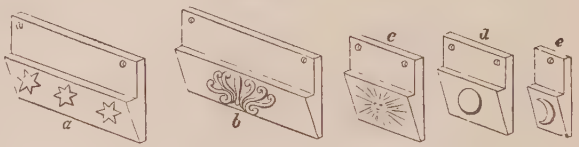

549. *Various other articles* might be employed to cover and ornament the walls of cottages, according to the effect intended to be produced. Trellis-work of various kinds gives a gay and dressed appearance, suitable for the immediate neighbourhood of a large town. A marine character may be given by shells; a rustic one by bark of trees; and a grotesque one by roots of trees; that of a Dutch cottage by glazed quarries (square tiles); and that of a Russian log-house by the outside slabs of trees (the first pieces sawn off, to reduce the trunk to a square, and of course flat on one side, and round on the other); the expression of warmth may be produced by clothing the walls with reeds; and of coolness by blue slates, &c.

550. *The use of barge-boards, ornamental chimney tops, vases, verandas, terrace parapets, balconies, flower-stands, mignonette boxes, &c.*, may be considered as having been sufficiently illustrated in the preceding chapter. We have not hitherto, however, mentioned one very simple but neat cottage ornament, the sparrow pot, fig. 468, which is made of common potter's ware, and projected from under the eaves of cottage roofs at regular distances, by simply placing the pots, which have holes in the side of their bottoms, on nails or wooden pegs. The use of these sparrow pots is, to prevent the birds from dirtying the walls or windows with what falls from their nests, by keeping them farther from the wall; they also supply an easy means of taking either the birds or their eggs. We have seen a swallow pot for the same purpose, made by Adams, Gray's Inn Lane; but we are not certain that it succeeds. High and ornamental chimney tops will, however, generally be found to afford suitable angles and recesses for that bird (so useful to the cultivator in destroying winged insects) to build in.

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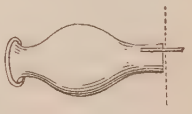

551. *The Doors of Cottages* may be ornamented by adding strips of deal, in the form of muntins, styles, rails, beads, &c.; by ornamental hinges and latches; or by studding them over with imitation door nails. The plain door, fig. 469, may be rendered architectural, in the Gothic style, at a very trifling expense, by fillets nailed on so as to produce the effect of figs. 470, 471, or 472, or that of fig. 473; or by nails, as in figs. 474, 475, and 476. The woodwork should be painted in imitation of oak, and the heads of

469 470 471 472 473 474 475 476

the nails should be black. These nails are to be procured complete, of different shapes, in cast iron; but they are equally fit for producing effect when the heads are made of wood, and fastened on by a brad. When properly painted, it is impossible to distinguish the wooden nails from the iron ones. The shapes of the heads of these nails may be round, square, triangular, or polygonal; and with either flat or raised surfaces. A few of the different forms are shown in fig. 477. Ornamental hinges, or plates of iron as

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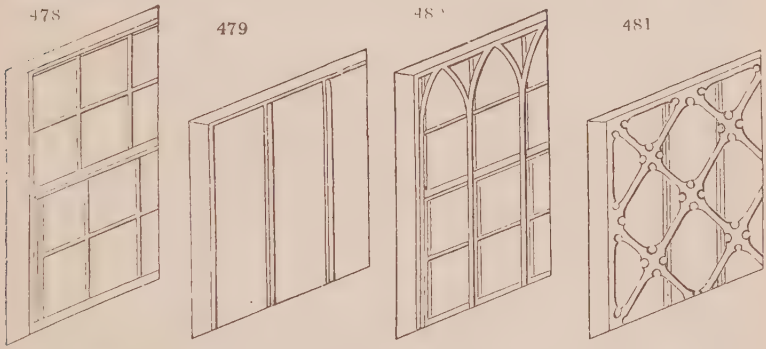
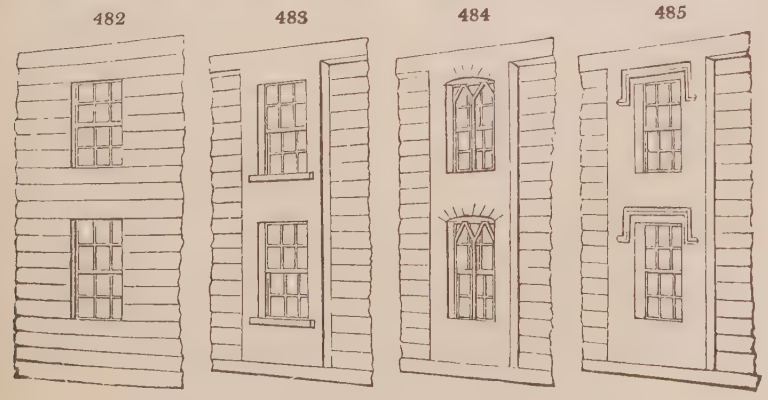
in figs 474 and 475, into which ornamental nails are driven, may also be imitated in wood, and completely disguised by paint; as may be certain parts of common latches, the

escutcheons of keyholes, &c. All knobs to cottage doors should be of real oak, laburnum (false ebony, as it is called by the French, from its hardness and blackness), yew, box, or other hard and tough wood, or of iron blackened or bronzed, but never of brass, which is too fine, and is besides liable to tarnish. The knobs, and other iron work of doors, may be blackened, by heating them nearly red hot, and immediately plunging them in oil; after being taken out and dried, they are polished with a coarse woollen cloth. Knobs, nail heads, and other parts of doors, whether of iron or wood, may be made to imitate bronze, by first painting them of a deep yellow colour, and then green: before the green is quite dry, it should be rubbed off the projecting parts, so as to allow the yellow to be seen through it. The greatest ornaments to cottage doors are, the porch, the penthouse roof, and the projecting canopy or shelf supported by brackets; but these may be considered as already disposed of.

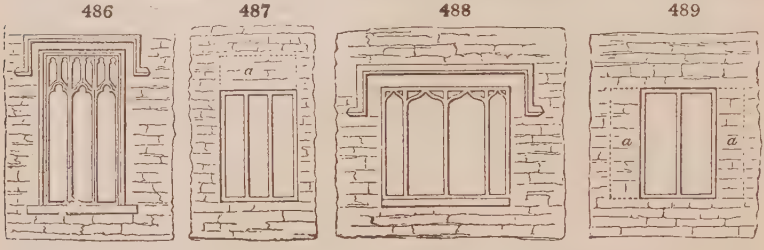
552. *Windows* may be ornamented in a great variety of ways. A plain sash or lattice window, figs. 478 and 479, may be disguised by a Gothic framework being put before it, as in figs. 480 and 481. In these cases it is supposed that the window to be disguised



shows outside reveals of at least six inches in depth, and that the thickness of the framework is not more than an inch, which will still leave five inches of reveal; a deep reveal being always desirable, as expressive of the thickness and strength of the walls. To disguise windows placed in nogging, studwork, weather-boarding, or other kinds of thin walls, which prevent any reveal from being shown on the outside, an artificial reveal must first be formed round the window by a projecting facing, in the manner of an architrave; and to be truly architectural, and to convey the expression of strength, this facing ought to be continued to the ground below, and to the roof above. Fig. 482 shows a portion of the front of a common weather-boarded cottage, in which it is desired to improve the appearance of the windows. Fig. 483 shows the windows improved in the manner described. On the supposition that these windows gave light to a stable and hayloft, to a tool-house with a seed-room over, or to any apartment not occupied as a dwelling, the windows might be further ornamented by placing a framework before the glass, as in fig. 484; or Gothic labels might be added, as in fig. 485. It will readily be conceived

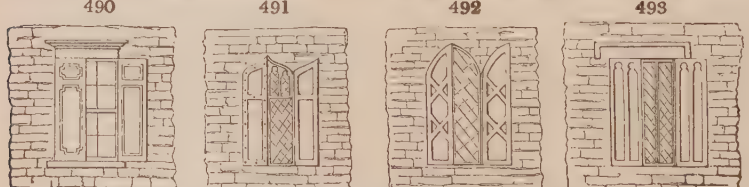


that, by the application of facings round windows, and by placing framework, judiciously painted and shaded to imitate mullions and their mouldings, before them, an inexhaustible source is opened for the improvement of commonplace windows. Where the window to be improved is flush with the outside wall, even its proportions might occasionally be changed; its height might be added to by using framework in which there was much tracery in the upper part, painting the wall immediately behind it black; and the width might be increased in the same manner, by having narrow side-lights, and broad mullions and transoms. Thus, fig. 486 might be placed before fig. 487, and fig. 488 before fig. 489; the spaces marked *a* in both figures being painted black. In a country like



Britain, where the cottage windows are generally low and broad, nothing adds more dignity of character to a dwelling than heightening the windows; because high windows are expressive of lofty rooms. Where height cannot be given, and the obvious tendency of the openings is to width, the effect of the elevation is improved by increasing that tendency, because the idea of a larger room is thus given. From what we have said on the subject of disguising and ornamenting windows, we hope no reader will for a moment suppose that we intend any of the frames to be placed before the windows of the dwelling-rooms of cottages, in such a manner as to diminish the quantity of light and air admitted by them, or to injure the prospect seen from them. Nothing can be truly an ornament, or an improvement, to a house, which in the slightest degree diminishes the comforts or enjoyments of the occupier. There are few things to which we have a greater dislike than the practice of some great owners of parks, of putting labourers to live in lodges, and other ornamental buildings, which, with a great display externally, are scarcely habitable within.

553. *Outside Shutters* to windows or doors certainly cannot be considered as ornamental. To see on the outside of a building what we are accustomed to see on the inside, seems an offence against propriety; while it gives, at the same time, the idea of meanness and insecurity. Nevertheless, it is certainly more economical, in building a cottage, to have outside shutters than inside ones; and this circumstance, together with the influence that it is likely to have on the comfort of the cottager, being duly taken into consideration, we ought to moderate our dislike to them. What, perhaps, increases this dislike is the practice of holding forth these shutters as ornaments, by painting them green, and other gaudy colours; instead of keeping them subordinate, by making them the colour of the walls, or of oak; or by avowing them, and giving them the character of great strength, by fillets of wood, and nail heads, painted in imitation of iron; or by adding some description of architectural expression. When we consider the economy produced in interior finishing by having outside shutters, we think that, treated in this manner, they might be admitted even in ornamental cottages. Figs. 490, 491, 492, and 493, are examples of what may be called architectural shutters: those which



are meant to be completely subordinate should be painted, and marked with lines, in exact imitation of the forms and materials of the walls against which they are to be turned back. We have seen houses in the suburbs of Königsberg with the outside shutters painted so exactly like the walls on both sides, that, when shut, the house appeared to be without windows: and we were informed in 1813, by M. Koch, that several

houses escaped in this way from being plundered by the retreating French army, during the preceding winter. In the Duke of Northumberland's house, in the Strand, London, there is a gateway painted so exactly like the wall, as to deceive every body. Hinged shutters, when folded back, should be made fast in that position by the same bolt as that which fastens them when closed; and the strongest bolt for this purpose is one in which the end is turned up so as to form the handle, and render riveting on the knob unnecessary, fig. 494. The hinges used should be what are called set-back hinges, when it is wished to make the shutters fit close to the windows when shut, and to throw them back close to the wall when open, as shown in fig. 495. Outside shutters might also be made to slide in grooves, in the manner which we shall notice when speaking of outside blinds. Thus, outside shutters, which at first sight appear a deformity, may be converted into a source of beauty; for taste, like necessity, must bend to circumstances. The truth is, that the foundation of all taste, beyond that which is merely physical, lies in the mind; and, as a writer in the *New Monthly Magazine* observes, "every man manufactures for himself his own sublimity and beauty."

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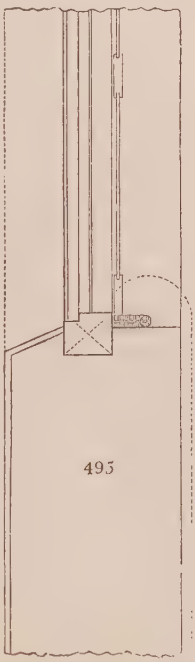

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554. Outside Blinds form both elegant and useful ornaments to windows. The mind is at once reconciled to them, from the idea which they convey of shading and protecting something delicate and refined within. Their expression is the very opposite of that of commonplace window shutters, noble rather than mean; and the reason is, because, in Britain at least, they are almost exclusively used in superior houses. They have not only the effect of shading the curtains, carpets, and other furniture in a room, from the direct rays of the sun, and so preserving their colours; but, by reflecting back the sun's rays, they keep the rooms cooler during summer, and also darker; which last circumstance lessens the inducement for flies and other winged insects to intrude themselves. These outside blinds being only necessary during sunshine, various contrivances have been invented for putting them up in a compact form, during the night, or in cloudy weather; and this circumstance has given rise to boxes with cornices, which are fitted to the upper parts of windows, and joined to narrow wooden facings, or architraves, which extend along the reveals down each side. These boxes and facings are always more or less ornamental; and hence, even without blinds in them, they confer, when added to windows, a certain degree of dignity and beauty. All the different kinds of outside window blinds may be included in three divisions; viz., shutter blinds, Venetian blinds, and cloth or curtain blinds.

555. Shutter Blinds of the commonest kind, sometimes called folding Venetian blinds, are nothing more than outside shutters, opening in the middle, each shutter framed so as to form one panel, which is filled in with what are technically called luffer boards (inclined boards placed one above another in an aperture, so as to admit air, without permitting the rain to penetrate). These luffer boards are either fixed, or turn on pivots in the styles of their frames; their action, in the latter case, being like that of the common Venetian blinds. In shutter blinds, where the luffer boards move (which is always the preferable plan, as by it the admission of light and air can be better regulated, the movement is effected by a lever handle fixed on one of the luffer boards. These boards might be placed vertically, instead of horizontally; but the greater length required would render them liable to warp, and of course the shading would be imperfect. Outside shutter blinds are generally hinged like outside window shutters, and fastened back against the wall like them, by bolts, or button fastenings; but in very windy situations they are sometimes made to slide in grooves, which, as they are commonly made, are by no means ornamental; but by disguising them as string-courses, or labels, and painting them of the same colour as the walls, they may be rendered architectural as well as useful. These blinds, when the luffer boarding is shut close, serve, during night, as a secure window-shutter. In situations much exposed to the sun and wind, we consider this description of blinds, either running in grooves with fixed luffer boarding, or hinged and furnished with bolts or other fastenings, superior to any of the kinds of hanging outside blinds about to be described. From

the manner in which shutter blinds are generally constructed and hung, their outer surface, when shut, is even with that of the wall. This is objected to by some, in a picturesque point of view, as depriving the window of the effect of the lines of shade that would otherwise be thrown upon it by the depth of the reveals. To overcome this objection, it is only necessary to form the luffer boarding narrower, say two inches in width, and to hang the blinds with set-back hinges, so as to shut them close against the sash frame, like the outside shutter in fig. 495. Thus, if the depth of the reveal be seven inches without the shutter blind, it will only be reduced to five inches with it.

556. *Venetian outside Blinds,* of the common kind, only differ from inside Venetian blinds in having cornice boxes at top into which the blinds are drawn up, and frames at the sides which confine the ends of the laths forming the blinds, and prevent them from being blown about by the wind. In these blinds, instead of the laths being hung on tape, as is customary with inside Venetian blinds, slight brass chains are sometimes used. Outside blinds are generally painted of a stone or cream colour in the country; and green in towns. In Gothic cottages, showing oak framework externally, they may be painted in imitation of that wood.

557. *The Venetian Fan Blind,* an improvement on the common Venetian blind, is made by Messrs. Barron and Mills of London, and its object is, to admit a greater quantity of light and air than is done by either the common Venetian blind or the shutter blind. For this purpose the front of the blind is projected from the wall, at an angle which may be varied at pleasure from 1° to 45°; and to prevent the sun from shining into the windows on the sides, admitting at the same time free circulation of air, fan blinds are there introduced. Both the front blind and fans are worked by means of one line connected with cords and pulleys, which is made fast to the frame in the same manner as in the common outside Venetian blinds. The front blind may be pulled up, and completely concealed under the cornice box at top, while the fan blind folds into a narrow box provided for it in the side frame. Hence, when this description of blind is not in use, the cornice box and side frame of the window have exactly the same appearance as those of any other hanging blind. A detailed account of the very intricate construction of this blind will be found in the *Repertory of Arts,* vol. viii. p. 449.; and we shall recur to it when entering more at length into the subject of blinds, under the head of Exterior Finishing to Villas. There is another description of outside Venetian blinds, in which the laths are formed of iron, and copper chains supply the place of tape. These blinds are fixed at top to a box which projects from the window, and are attached at the other end to a roller having a pulley at one end, by which, and by a cord which passes over a pulley in the reveal of the window at top, the blind is let down and rolled up. These bullet-proof blinds, as they are called, are manufactured by Bramah of Pimlico, and have been employed by the Duke of Wellington, at Apsley House, to protect his windows from the mob. They are most unsightly objects, and are only mentioned here as connected with the subject of Venetian blinds.

558. *Outside Curtain or Cloth Blinds* are of various kinds. The simplest form is where a curtain of the size of the opening of the window is furnished with rings on the margin of each side, which run upon two upright rods, concealed or not, according to the taste or means of the party, by side-framing. The lower edge of the curtain is attached to an irod rod, or a fillet of wood, to keep it down by its weight; and to this there is a cord attached, which, passing over a pulley in the middle of the soffit of the window, admits of pulling up the curtain, and fastening it in the usual manner. By another plan, the curtain is made to spread out in front like the Venetian fan blind. This variety is called a bonnet blind, and on it Messrs. Barron and Mills have made an improvement, which we shall hereafter describe. When these blinds are drawn up, they are as completely concealed, and protected from the weather by the box and frame, as any other description of blinds. The cloth generally used is strong linen, of the kind called gingham, and is generally striped with blue and white colours, which harmonise remarkably well with the sky and clouds. The cornice and frames are generally painted of a stone colour. A patent was taken out in 1826 for an improved mode of stretching by a contracting and collapsing apparatus, but it does not appear to have come into use. (See *Rep. of Arts,* vol. iv. p. 195.)

559. *Various other outside blinds of the curtain kind* have been used, and might be occasionally introduced in cottages. Projecting canopies, of different kinds, from the top of the window, might have corresponding balconies for flowers at the bottom; and, common curtain rods being concealed in the top of each canopy and in the bottom of each balcony, curtains, with rings affixed in the usual manner, might run on them, and be opened by hand, in the middle or at the sides, at pleasure. This would be a very cheap exterior blind, and one which, judiciously placed over the principal window of a cottage, would produce a very striking effect. Another description of blind is formed

by straining canvass, gauze, or fine wire cloth, on three or more light wooden frames; and, by hanging these horizontally to a frame of the size of the window, the small frames being connected on the opposite side to that on which they are hinged, by two slips of wood or by iron rods, they may be moved sympathetically to any angle, so as to keep out the sun. The slips of wood or iron rods must be screwed on so as to allow them to have free action at the head, otherwise they will not fall down. Blinds of this sort are kept in their position by a line fixed to the outer edge of the upper frame, which passes through a pulley at the upper end of the large frame, and being brought down, either on the inside of the window, or on the outside, is fastened as usual by a hook. It is evident that blinds of this description may also be hinged vertically; and if only two are used for each window, and these are hinged back to back to a style in the centre, one half of the window might always be uncovered, because before twelve o'clock it would be only requisite to keep that blind shut which was next the east, and after twelve o'clock that one which was next the west. Such blinds, however, would be chiefly applicable to windows facing the south. If, instead of being hinged back to back in the middle of the window, they were hinged to the side styles, and furnished with set-off hinges, they would form shutter blinds of a simple and cheap description. Roller outside blinds, such as are used to shade shop windows, are capable of a variety of useful and ornamental applications on the exterior of cottages.

560. *Wire outside Blinds* have not hitherto been used; but the very fine wire cloth now applied as inside blinds, might, we think, in some cases be advantageously placed outside, either as leaf or sympathetic frame blinds, § 559, or as shutter blinds. The great advantage of this wire cloth is, that it admits a view of what is without from within, while it completely excludes a view of what is within from without. Where a cottage is placed by the roadside, such blinds are very desirable, not only on these accounts, but also because they keep out the dust; and they are not less so where the windows on the south side of a house command a fine prospect. Much of the enjoyment of some rooms, in country houses, is lost during the finest weather of summer, from the necessity of keeping down the blinds; but, with wire blinds, the heat and great part of the light might be excluded, and yet the prospect be not only enjoyed, but even improved in effect, by the darkness of the room acting on the eye like the tube of a telescope. They should be painted to preserve them from the weather; and they may, in addition, be ornamented with landscapes, figures, or other objects; or, in the case of a country tradesman, in a roadside cottage, they may exhibit the owner's name, or the implements or products of his trade.

561. *Projecting fixed Canopies* are sometimes used for giving consequence to windows; and they might be occasionally employed in cottages. They are framed in wood, with paneled soffits, moulded cornices, and sometimes ornamented friezes, and they are supported by brackets. Figs. 496, 497, 498, 499, and 500, are canopies of this

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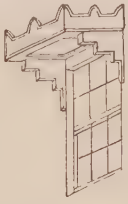

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sort. They may very properly be put over doors, and when they cannot be formed in solid timber, a plain kind of trellis-work may in some cases be introduced, for the purpose of supporting an ornamental climber.

562. *Other architectural modes of ornamenting the exteriors of either old or new Cottages* might be mentioned but we have said enough to lead the reader into a train of thought on the subject, and to point out to him to what parts of a plain cottage he ought chiefly to direct his attention, when his object is to ornament it.

563. *Ornamenting the exterior of Cottages by the productions of Horticulture, and by Landscape-Gardening*, is a subject which has occasionally occupied our attention in the course of the preceding chapter; and that of laying out the grounds round ornamental cottages and villas will be treated of in a future division of the work. We may here repeat, what we have before stated incidentally, that we by no means advise much to be attempted in the way of ornamenting cottages in the country by means of vegetation,

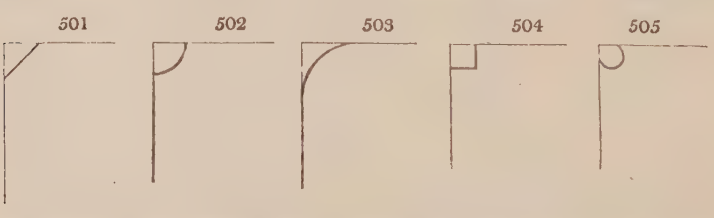
on account of the damp produced, and the insects harboured, by leaves; and because, in proportion as any building depends for its effect on a covering of vegetation, in the same proportion does it lose its beauty as a piece of Architecture. We are more particularly anxious to impress on the minds of our readers the impropriety of planting trees, or creepers of any kind, against walls of cottages, which are shaded by opaque-roofed verandas, penthouses, or far-projecting eaves; because in such situations they can never thrive, and not only have a sickly and disagreeable appearance, but actually, to a certain extent, contaminate the air by their decaying foliage. Life without health is without beauty.

Sect. II. *Designs and Directions for the Interior Finishing of Cottage Dwellings.*

564. *The Walls of a Cottage*, viewed externally, ought, by the appearance of the nature of the materials, and the mode in which they are put together, to give at the first glance unquestionable evidence of their sufficiency to support the roof. This being the case, on entering the dwelling we dispense with a repetition of this evidence, as far as the roof is concerned; but if the apartments are large, and one is placed over another, as in houses of two or more stories, we require the appearance of strength in the ceilings to support the floor above them. Hence, the ceilings, in all very large rooms, should be thrown into compartments, by the reality, or by the appearance, of beams crossing the ceiling in the direction of its breadth, or shortest diameter. On the same principle it is desirable that these beams should be, or appear to be, supported at the extremities by piers or pilasters projecting from the walls, and sometimes even by detached columns. The finishing of these piers or columns is generally in imitation of some description of stone or marble, as belonging to the wall; and that of the horizontal beams, of oak, or some other timber, as belonging to the superincumbent floor, or the roof.

565. *The Interior of the Walls of a Cottage* of the humblest class may, in some cases, require no other finishing than the rubbing or dressing of the material of the wall. This may be the case when the walls are built of brick, and the inner courses are rubbed and worked to a fair smooth surface. Rubbed sandstone may be applied in the same manner. For the plainest description of cottage the walls may be completely finished with one coating of plaster; either by mixing the lime with a portion of Roman cement, or by using fresh-burnt stone lime and sharp sand, in the proportions of five of the latter to two of the former. The basement stories of many of the commoner street houses about London are finished in this manner; by which not only the labour of putting on two coats of plaster is saved, but a more durable surface to the wall is produced. In general, however, the internal surfaces of cottage walls, of whatever materials they are composed, require to be plastered as indicated in the specifications already given; for example, in § 80, and in § 235.

566. *Without a Cornice no Room can have a finished Appearance*, therefore we recommend cornices to be introduced into the living-rooms and principal bed-rooms of even the humblest cottages. The simplest cornice is formed by filling up the angle by a straight hypotenuse line, fig. 501; the next step is to curve this line convexly, fig. 502, or concavely, fig. 503; a square fillet, fig. 504, may be introduced; or a round bead, fig. 505. In cottage dwellings, this bead is frequently formed of wood, as being



easier executed in that material than in plaster. The effect, when the bead is about an inch in diameter, is satisfactory; and we think, instead of wood, it might, in some cases, be made of iron, fastened to the walls with staples; and with one or two hooks to each length of rod between the staples, for the purpose of hanging pictures or other articles, agreeably to the practice in what are called gentlemen's houses. It is easy to conceive how a variety of cornices may be deduced from this simple form: by flattening the circle, by narrowing it; by causing it to present the broad end of an oval, or the narrow end; and by its being made, sometimes, to seem chiefly projecting from the wall, and, sometimes, chiefly from the ceiling. From these elementary forms a great variety of cornices may be produced. For example, in figs. 506 and 507 we

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have ten different variations of the concave line, the lightest and most agreeable feature of all cornices, particularly when viewed from below, and the characteristic of the Gothic

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cornice. Fig. 508 shows five sections of cornices having a convex curve for a leading

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member. Fig. 509 shows modifications of the square, a leading feature in Grecian and Roman cornices. The square form, it thus appears, may be varied by approaches

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to the parallelogram and to the rhomboid, and by altering its relative proportions with respect to the ceiling over it, and the surface of the wall beneath it. Composite cornices, fig. 510, may be formed by employing two or more of these five leading forms as

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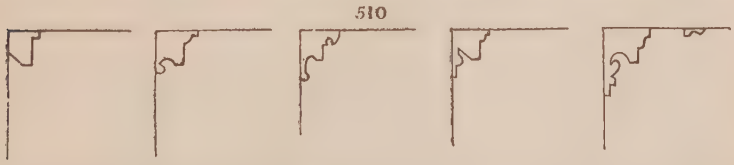


main features; and cornices in particular styles of architecture are obviously of easy composition, from the lines and forms which belong to those styles.

567. *The magnitude of a cornice* ought always to be regulated by the size of the room in which it is introduced; since the origin of the cornice of a column or wall was the edge of a plate of stone or timber, bedded on that column or wall, to receive with greater security, and give a better bearing to, what was to be placed upon it. A long narrow room does not require such a massive cornice as a square one covering the same surface, because there is less occasion for studying the security of the cross-beams or joists.

568. *Plaster Ornaments on Ceilings* have not hitherto been much introduced in cottages, on account of the expense. We scarcely think cornices with foliage or other cast ornaments desirable in plain cottages; but a rose or other flower, in plaster or composition, might often be introduced, at very little expense, in the centre of the ceiling of a cottage parlour. There is scarcely any part of a house in which a single ornamental form produces so much effect as in the centre of a ceiling. Fortunately for the builders

of even plain cottages, ornaments suitable for this purpose, and for various others in the finishings and fittings-up of rooms, have recently been manufactured by Messrs. Bielefelds and Haselden, at a very low price, of a description of papier maché. They are perfectly light and strong; and may be sent to any part of the world. They are fixed on by tacks or brads; and, being painted, will last as long as any other part of a house. Fig. 511, p. 275, is one foot in diameter, and costs 7*s.*; fig. 512 is two feet across, and costs £1; and fig. 513 is two feet and a half across, and costs £1 : 15*s.* For the ceiling of the principal room of a well-finished cottage, it could not be thought extravagant to lay out 7*s.* on such an ornament as fig. 511. In all cases of introducing such ornaments, due preparation should be made for them, by raised borders, or mouldings, which should enclose them in a sort of framework.

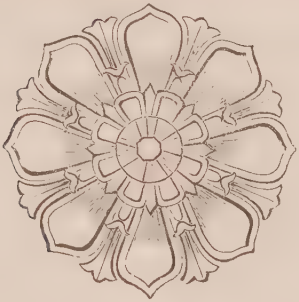
569. *The Paneling of the Walls or the Ceilings of the Rooms of plain Cottages* is seldom attempted, otherwise than by lines painted on the wall, or by coloured papers; but there is no other reason than the expense, why it should not be adopted in the humblest cottage, as well as in the highly enriched villa. The occupant of the one may have a mind as susceptible of deriving enjoyment from the contemplation of elegant forms as that of the other, and he is therefore entitled to procure them whenever it is in his power to do so without interfering with any moral duty. Panels of this sort are generally formed by raised mouldings in plaster or stucco; but they may sometimes be more cheaply produced by mouldings of papier maché, some of which, such as figs. 514, 515, 516, and 517, p. 276, may be bought at from 2*d.* to 3*d.* per foot.

570. *Whitewashing and Colouring the inside Walls and the Ceilings of Cottages* should not be attempted till they have dried at least a year. If the plaster be of the commonest kind, without a finishing coat of stucco, it is only adapted for water colours, or colours rendered tenacious by glue, paste, or other mucilaginous matter, instead of oil; because of its porosity, which would wholly absorb the oil. The most common colouring for cottage walls is what is technically called lime whiting, which is nothing more than the finest particles of lime or chalk mixed with water, with the addition of a small quantity of size. The colour of this is varied by the addition of the black of charcoal (commonly called blue black, as distinguished from the soot of lamps, which is called lamp-black), or by yellow ochre, by verdigrise, or any cheap pigment.

571. *A superior description of whitening for interior walls* is thus formed:—Procure a quantity of the very best lime, and pass it through fine linen; pour it into a large tub, furnished with a spigot at the height equal to that which the lime occupies: fill the tub with clear spring water; beat the mixture with instruments made of wood, and then allow it to settle for twenty-four hours. When this period has elapsed, open the spigot, and allow the water to run off; then supply the tub with fresh water, and continue this operation for several days, until the lime attains the greatest degree of whiteness. When you allow the water finally to run off, the lime will be found in the consistency of paste; but when used it is necessary to mix a little Prussian blue, or indigo, to relieve the brightness of the white, and a small quantity of turpentine, to give it brilliancy. The size proper for it is made of glove leather, with the addition of some alum; and the whole is applied with a strong brush, in five or six layers, to new plaster. The wall is rubbed strongly over with a brush of hogs' bristles after the painting is dry, which gives it its lustre and value, and makes it appear like marble or stucco. (*Partington's Builder's Guide*, p. 550.)

572. *To whiten the Ceilings of Cottages.* Take the best white chalk, and add a little of the black of charcoal, "to prevent the white from growing reddish; infuse them separately in water; mix the whole with half water and half size of glove leather." The size requires to be diluted, otherwise the whiting would come off in rolls when dry. Give two layers of this tint while it is lukewarm. (*Ibid.*) Instead of black, a small portion of any other colour may be mixed with the white, and Dutch pink is not unfrequently used for that purpose. The cornice, where there is one, forms a member of separation between the wall and the ceiling, and, being always an architectural object, should, for that reason, generally exhibit some colour belonging to stone, such as white, or some shade of yellow, grey, or brownish red.

573. *The colouring of the walls of rooms with water colours, or in what is called distemper*, only differs from whitewashing them, in the application being coloured. White, that is, lime or chalk, forms the groundwork or body of the composition, and the colouring is added by some concentrated vegetable extract, or metallic oxide. All the different colours are used for the walls of rooms; but the most common, after white, are some shades of yellow, red, green, or grey. As a general rule, the ceiling should be of a lighter colour than the walls; because it is found that, when it is darker, it is apparently brought nearer to the eye, and has consequently the effect of making the room appear low. Rooms which are too low may on the same principle be made to appear somewhat higher than they are, by having the walls a shade darker than is usual, and the



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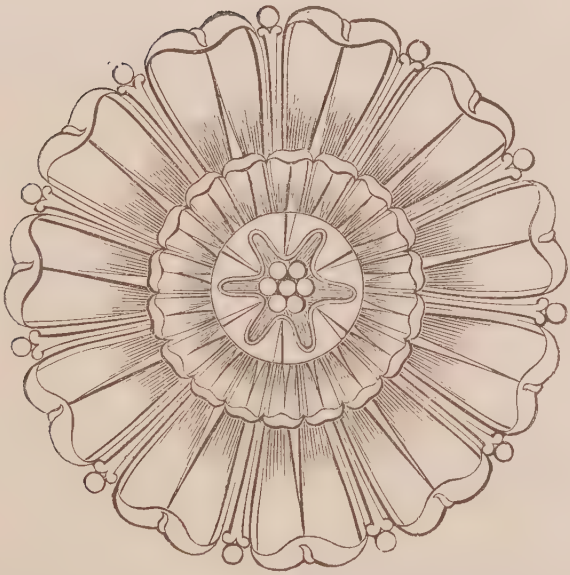

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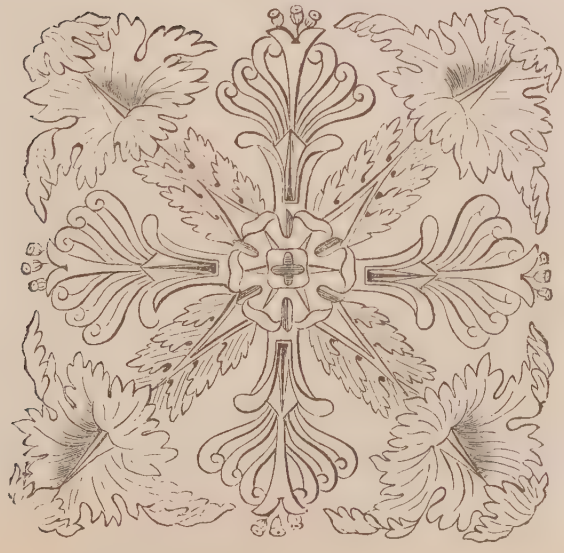

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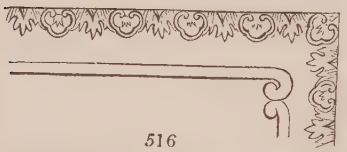

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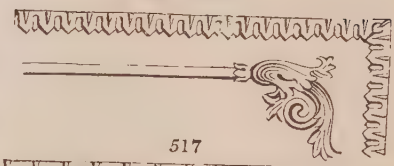

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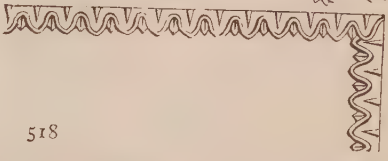

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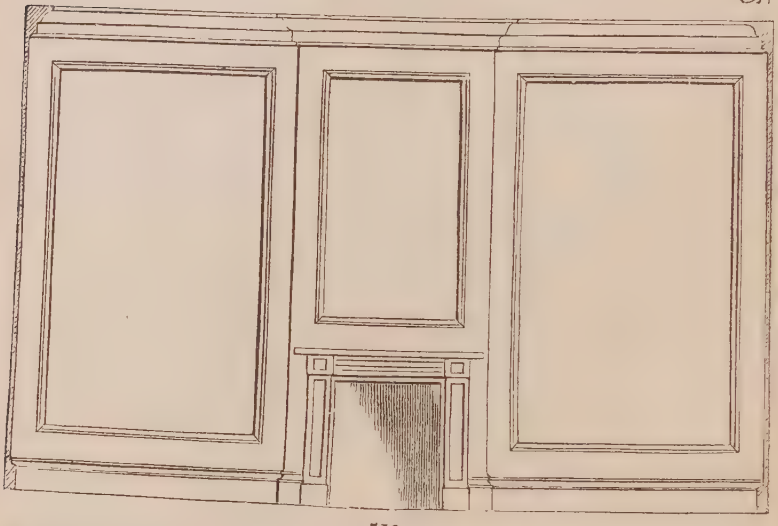

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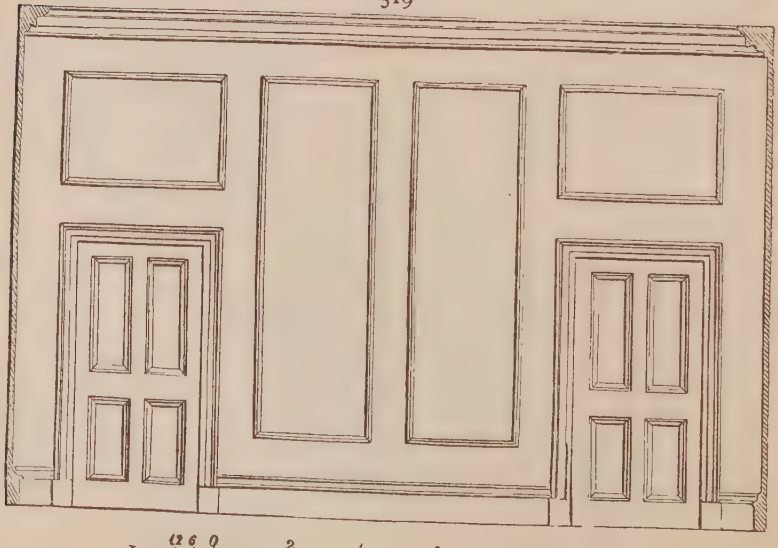

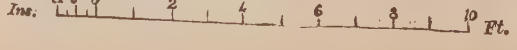

ceilings a shade lighter, and this effect may be heightened by a slight gradation in the shade of the wall from the base to the cornice. The manner in which the cornice is painted may also be made to cooperate in conveying the idea of height or the contrary. Small lines and mouldings, and faint shadows, convey the idea of distance from the eye, and the contrary that of being near it. Cornices of small dimensions, in plaster, may be apparently increased by lines of colour, and members not sufficiently distinct may be rendered so by shades. When the walls of rooms are paneled, the shade of colour of the panel, and of the styles, rails, and munnions, should be the same: but the shades of the mouldings between them should be lighter on the side on which the light is supposed to come; and darker on the opposite side, as in fig. 518, p. 276. Sometimes panels are formed by lines in imitation of raised mouldings as in fig. 519, which, with the preceding figure, may serve to show the method of paneling in plaster as well as in colours.

574. *As a cheap inside paint*, which a cottager may prepare, and lay on himself, we shall give a receipt for milk paint: we could add a number of others; but we have made choice of this, from having been assured of its superiority.

575. *Milk Paint.* Take of skimmed milk nearly two quarts; of fresh slacked lime, about six ounces and a half; of linseed oil four ounces, and of whiting three pounds: put the lime into a stone vessel, and pour upon it a sufficient quantity of milk to form a mixture, resembling thin cream; then add the oil a little at a time, stirring it with a small spatula; the remaining milk is then to be added, and lastly the whiting. The milk must on no account be sour. Slake the lime by dipping the pieces in water, out of which it is to be immediately taken, and left to slack in the air. For fine white paint, the oil of caraways is best, because colourless; but with ochres the commonest oils may be used. The oil, when mixed with the milk and lime, entirely disappears, and is totally dissolved by the lime, forming a calcareous soap. The whiting, or ochre, is to be gently crumbled on the surface of the fluid, which it gradually imbibes, and at last sinks: at this period it must be well stirred in. This paint may be coloured like distemper or size-colour, with levigated charcoal, yellow ochre, &c., and used in the same manner. The quantity here prescribed is sufficient to cover twenty-seven square yards with the first coat, and it will cost about three-halfpence a yard. The same paint will do for out-door work by the addition of two ounces of slaked lime; two ounces of linseed oil, and two ounces of white Burgundy pitch; the pitch to be melted in a gentle heat with the oil, and then added to the smooth mixture of the milk and lime. In cold weather it must be mixed warm, to facilitate its incorporation with the milk. (*Smith's Art of House-Painting*, 1825, p. 26.)

576. *The painting of the walls of rooms in oil* is seldom attempted, unless the walls have been finished with a coat of stucco; but, wherever both can be afforded, the result, in point of durability and beauty, is far preferable to what can be produced by water colours. The great advantage of oil colours is, that they will bear washing with soap and water, so that a room once finished with them will not require repainting for many years.

577. *Painting the internal woodwork of cottages* ought never to be neglected, both on account of its preservative quality and its ornamental effect. All woodwork, avowed as such, should, if possible, be grained in imitation of some natural wood; not with a view of having the imitation mistaken for the original, but rather to create allusion to it, and, by a diversity of lines and shades, to produce a kind of variety and intricacy, which affords more pleasure to the eye than a flat shade of colour. The most suitable colour for the woodwork of cottages is undoubtedly that of the prevailing timber of the district or country in which the cottage is built; at the same time, where this timber is but slightly veined or marked, it is allowable and advisable to imitate a better description of wood. Thus, in England, the prevailing timber in several districts is fir and poplar; but, as the wood of these trees is much inferior in beauty to that of the oak, the elm, or the chestnut, which respectively prevail in different districts in Britain, it would be allowable, and what would be considered in good taste, for the painter to imitate them. In this, as in every thing else, the Architect must be guided by the object in view. If a cottage be in the Swiss style, the larch and silver fir, being the two woods chiefly used in cottages in Switzerland, should be either procured by the builder, or imitated by the painter. In an Indian or Chinese cottage, the bamboo and other tropical woods, or their imitations, should predominate; and the same principle may be applied to other countries; always, however, bearing in mind, that the business of an Architect of reason and taste is not to produce fac-similes, or repetitions of objects, but imitations of their style and manner. For the method of imitating woods in painting, or what is technically called graining, as well as for the practical details of the painter's art, we refer to that part of this work where painting is treated of systematically, and also to *Smith's Art of House-Painting*, improved by Butcher, 12mo, London, 1825, price 1*s.* 6*d.*

578. *The Process of Stenciling Walls or Ceilings.* Stenciling, said to be a corruption

of stained ceiling, is of two kinds. The first, most ancient, and most universal mode, which is still generally practised in Italy, both on the outsides and insides of buildings, is that of pricking through, with a large-sized needle, the exact outline of a figure, previously drawn on paper or oilcloth; and then placing it against the wall, and striking the surface with a small gauze bag containing red or white chalk in powder, or powdered charcoal. The powder goes through the holes in the paper, and, lodging in the plaster, forms an outline, which is afterwards filled up by the painter. Sometimes, instead of pricking through the drawing, it is placed against the plaster before the latter has dried, and the outline is impressed on it by passing a blunt point over the outlines on the paper. This is generally done in the Italian practice of *al fresco*, a term applied in that country to the process of painting in water-colours on plaster, when newly laid on, and before it has set. The second mode of stencilling is the most common in Britain; by it, the patterns are all cut out in pasteboard or oilcloth, and as many pieces of board or cloth are employed for each figure, or compartment, as there are colours or shades to be laid on. This mode of ornamenting the walls of rooms is not unsuitable for cottages of the humblest description, on account of its cheapness; and because, in remote places, or in new countries, it might be done by the cottager himself, or by the local plasterer or house-painter. The beauty of the effect produced will depend on the suitableness of the forms and colours of the figures to the style of the Architecture of the cottage; and on their disposition on the walls. Where the cottage displays externally any kind of architectural style, it is reasonable to conclude that some of the same style should prevail in the ornaments within, as well as in the furniture. A Gothic cottage should display lines, forms, and ornaments belonging to that style of Architecture, in all its interior, as well as exterior detail; and the same of other styles, or sub-styles. More judgment is required in the disposition than in the choice of ornament. There ought always to be an obvious reason why an ornament is placed in one position rather than in another; and wherever there is ornament or enrichment, there must be plain or flat surfaces to contrast with it. The side-walls of a room equally ornamented in every part by elaborate stenciling, or by a rich paper, would be intolerable, were it not for the contrast produced by the plain ceiling, and by the border with which the paper, or stenciling is finished under the cornice at top, and above the base or surbase below. If the same border, however, were carried across the middle of the paper, it would be as intolerable as the paper without a border, because the spectator would see no sufficient reason for its being placed there. In stenciling, and in every other mode of putting ornaments on walls, no figure, however appropriate and beautiful in itself, should be put down at random; nor should any wall be covered with figures for the sake of their individual beauty, but because they cooperate in forming a whole, or a particular object. That object may be the enrichment of the entire surface of the wall, by covering it, as it were, with a rich cloth or printed paper; or, instead of a cloth, by covering it, with a picture in perspective. The cloth, as a production of the loom, and the paper, as produced by printing, ought to exhibit a succession of the same figures at regular distances, and to be accompanied by all that uniformity and regularity which is characteristic of works effected by machinery. The perspective view, on the other hand, as an imitation of something existing, or supposed to exist, in nature, forms a whole with reference to itself, and not to the art by which it is produced, and consequently admits of almost endless variety.

579. *In the choice of patterns for stenciling*, not only the architectural style of the cottage, but its situation, whether in a town, the country, or in a village; and the occupation, native country, and taste or wishes, of the occupant, will naturally influence the artist. As contrast is one great source of beauty, both, as respects objects when placed so as to be seen together, and when placed so as to create allusion to other objects of the same order, but of a different class; so figures of flowers and plants in gay colours are more suitable for the town than the country, and figures of human beings, buildings, and streets, are more suitable for the country than for the town. The taste of a cottager living in a country far distant from that in which he was born may lead him to wish to create allusions to that country, by depicting some of its scenery; and, in like manner, another may desire to create allusions to scenery which he has heard of, but never seen. We state these things chiefly to show that, even in ornamenting walls, there should be a reason for every thing, and that this reason is, in every case, nothing more than a refinement on, or a correction, by a recurrence to original principles, of, the common practice of mankind. (See *Whittock's Decorative Painter's Guide.*)

580. *A simple and elegant mode of stenciling the walls of plain cottages* consists in throwing them into panels, with lines of dark brown or grey; the general colour of the wall being white, a pale yellow, or fawn colour; and in forming ornaments at the angles. These panels should be coloured of a shade darker than the spaces between them, which are left in imitation of styles, muntins, and cross rails; for there can be no doubt that all paneling has had its origin in wainscoting. The panel may be ornamented,

and the styles and rails left plain, or the contrary. It is easy to conceive that there may be a great variety of stencil paneling adapted to plain cottages, which any cottager or emigrant, who could mix milk with ochres or any cheap universal colour, and use a blacking brush, might do for himself.

581. *Papering the Walls of Rooms* is a very general practice in Britain; and is applicable, to a certain extent, even to the humblest cottages. It is not adapted for kitchens or other apartments in which the coarser domestic labours are constantly going forward; but it gives a clothed, warm, and comfortable air to bed-rooms, and an enriched finish to the better description of living-rooms. The variety of papers for rooms is almost endless; beginning with a flat shade of colour, and rising through patterns of one, two, or three, or more, to twenty or thirty different colours, or shades of colours, as in the printed landscapes, some years since introduced into this manufacture by the French. All this variety may either be printed on the paper in water colours, or in colours in which oil is introduced, so as to admit of their being washed with soap and water. The figures on papers may be classed as architectural, either in the Gothic, Grecian, or other styles; as imitations of nature, either plants or animals, or combinations of these in landscape scenery; or as historical or biographical, and, consequently, either groups of figures or portraits. As the fashions of most of these papers change as frequently as those of printed cottons, it would serve little purpose to offer designs of them, either for the choice of the builder or the direction of the manufacturer.

582. *The designs which are printed on papers*, like those which are printed on different cloths, may be divided into two kinds: those which are intended to be correct imitations of natural or artificial objects, such as of particular species of plants or animals; and those which are fanciful compositions of artificial forms and lines, or of plants and animals imagined in imitation of nature's general manner, but not copied from any of her specific objects. All ornaments truly architectural or sculptural are of this latter class, and they are in no style more beautifully exemplified than in the Grecian; and, perhaps, in no ornament of that style more elegantly than in the sculptured honeysuckle which decorates many of the friezes of the ancient temples. As this style of design brings into exercise the imagination and invention of the artist, while the other (that of copying specific objects) only calls forth his powers of imitation, the former must necessarily be considered higher in the scale; and hence we find that the ornaments of the most cultivated nations of antiquity are of this class, while those of nations who have never excelled in the arts of design, as the Chinese for example, are of the other. Thus, while Grecian or Roman ornaments have only in their forms a certain allusion to particular plants or animals, almost all the plants and animals on Chinese papers and cottons may be referred to particular species or varieties. The imaginative style of design, carried to a high degree of perfection, is addressed to the cultivated mind, and excites admiration on the same principle, though in an inferior degree, as a painting or a piece of sculpture; and the imitative style, carried to an equal degree of perfection, is addressed to the memory and the judgment, and gives pleasure to the mind, by its imitation of well known objects, and by the associations which their images recall. As a proof that the imaginative designs, if we may so term them, are more permanently satisfactory than the merely imitative or natural history ones, it may be stated that all those patterns of papers and cloths which have withstood the changes of fashion are of the former description; while all those patterns which have soonest palled on the public taste have been attempts at close imitations of nature. At a large manufactory of tea trays, and other articles in papier maché, at Wolverhampton, a trial was made, a few years ago, to substitute portraits of plants botanically correct, for the imaginary compositions of flowers and leaves generally used; but the change was found unsatisfactory, as the articles would not sell. The drawing-room walls of the celebrated stock-broker Goldschmidt, at Morden, were covered with silk, painted with flowers and other objects, which were all drawn and coloured with scientific accuracy. We recollect the principal flower was the *Narcissus Tazétta*, with its bulb and roots accurately portrayed; but, though we admired the figure in a botanical point of view, it gave us no pleasure as an ornament among other ornaments; because it had no connection with any of them, and did not combine with them in forming a whole. A showy geranium paper, and a red rose and green trellis paper, are seldom chosen but by those who cannot derive pleasure from a higher style of composition.

583. *In the choice of papers for a common cottage*, the same general principles may be observed respecting patterns and borders, as were mentioned under the head of stenciling. One of the best plain papers for the entrance lobby and the staircases of cottages, is one simply marked with lines in imitation of hewn stone; because, when any part of this paper is damaged, a piece, of the size of one of the stones, can be renewed, without having the appearance of a patch. There are very appropriate Gothic papers, with borders at the top, to imitate cornices, which are very suitable for Gothic cottages.

There are also papers covered with green trellis-work, with roses and other flowers entwined; and it is sometimes the custom to cover the ceilings, as well as the walls, with such papers. This practice may be allowable in towns, as creating an allusion to the country; but, in a country cottage, we consider it in bad taste, as not contrasting with local circumstances.

584. *An instructive natural history paper* for cottages, and the walls of nurseries and school-rooms, a contributor suggests, might be formed by printing figures of all the commoner and more important plants and animals with the scientific and popular names beneath them; each plant or animal being surrounded by lines, so as to appear either in frames, or as if painted on the ends of stones or bricks. The advantage of the framed lines would be to give unity to the paper as a whole, and also to admit of repairs by taking out any single frame or stone, and replacing it by another. There is no reason, but the expense, why a geographical paper should not be formed; or one exhibiting all the principal rivers, mountains, and cities in the world; or the portraits of eminent men, with their names; or perpetual almanacks; or lists of weights and measures; or chronological or arithmetical tables; or, in short, any useful and instructive subject, which it would be beneficial to the cottager to have frequently before his eyes. We all know how easily, and yet how deeply, the mind is impressed with objects that we are continually in the habit of seeing; and that what is learned through that medium in childhood is rarely, if ever, forgotten in after-life. Children, brought up in nurseries or cottages decorated in the manner we have mentioned, would thus have their minds stored with useful ideas, instead of fanciful images.

585. *The Floors of Cottages of the common kind* do not admit of much ornament. Entrance porches and lobbies may be paved with a description of tiles called quarries, which are formed in small squares of six inches on a side; coloured blue, red, drab, and black; and sold at Newcastle under Line, at from 2*s*. 2*d*. to 2*s*. 8*d*. per square yard. A superior sort is sold at 10*s*.; and a sort known as Wright's quarries, which have dark brown figures in pigment on their surface, let into a pale yellow ground, and are very ornamental, are sold for 25*s*. per superficial yard. In countries where tiles are not taxed as in Britain (where the duty, in 1832, is £1 : 4*s*. : 2*d*. per thousand), the price would of course be much cheaper. Quarries of different colours are set in mortar or cement, so as to appear like tessellated pavement; and Wright's figured quarries are used to form bordering and centres to his plain ones, or to floors of rubbed stone: in either case, they make a very ornamental and substantial flooring. When all the rooms of a cottage are on the ground floor, and when they are not flued under, a substitute for boards, at once ornamental, cheap, and comfortable, may be formed by paving them with one or different kinds of wood, obtained from the branches of trees, which have been cut into lengths of four or six inches, and set endways on gravel or in mortar; or, pieces of board, of various woods, resembling tile quarries in size, or stained of different colours by acids, might be embedded in cement, either in imitation of tessellated pavement, or of the Continental practice of parquetted floors. A very good composition for laying under such floors is made of one part of quicklime, two of sharp sand, and as much oil of any kind as will bring the other ingredients to the consistence of mortar. A sound, warm, and durable floor is formed in the following manner: the ground being well drained, and covered to the depth of a foot with loose stones, lay on these a stratum of a mixture of gravel and newly slacked lime, to the depth of six inches; let this be well beaten, and brought to a perfect level, and after it has dried a week or a fortnight, according to the weather, cover it, to the depth of two inches, with a composition of equal parts of quicklime and powdered smithy ashes, brought to the consistency of mortar by the addition of bullock's blood, stale milk, oil, or any other description of greasy matter. As soon as this is laid on, it must be well beaten with the back of a spade, or rolled with a cast-iron roller; after which, if immediately well and long rubbed with coarse woollen cloths, it may be brought to a high polish. The colour, when bullock's blood is used, is at first brown, but after some weeks it changes to a light grey. When yellow ochre is added to the mixture, a Bath stone colour is produced. One of the simplest modes of procuring a composition floor, in countries where Roman cement can be easily obtained, is to bed plain tiles in this material; then coat them over with a mixture composed of one part of cement, and two of sharp sand; and, a month afterwards, to give the floor a second coating of the same mixture, with the addition of as much lime and yellow ochre as will communicate a cream-coloured tinge to the surface. Or, the second coat may be composed of powdered Portland, Bath, or other freestone, and oxide of lead mixed up with oil, as in Hamlin's mastic (see § 527). A great object, in all ground-floors of cottages, is to lay such a foundation as to insure their dryness; we have mentioned several modes of attaining this end, and we add the following (which is said to be practised in Bengal), as suitable for districts in Britain, or other temperate climates, where pottery is cheap. "The area of the house or room to be floored is first made perfectly level; unglazed

earthen pots, each about a foot in height and large-bellied, are then placed with their mouths downwards, close together, over the whole surface. The vacant parts round the necks and tops of these pots are afterwards filled up with charcoal pounded fine (this substance being well known to resist damp); and, over the whole, a floor is formed of brick dust and lime, well worked together, and made as hard as possible. (*Mech. Mag.*, vol. xi. p. 21.) We shall describe different modes of forming composition floors for the upper stories of buildings, when giving designs for fire-proof houses, in our succeeding Book.

SECT. III. *Designs and Directions for internal Fittings-up for Cottage Dwellings.*

586. *Shelves* to pantries, closets, and closet cupboards should be formed of boards of some description of wood not liable to communicate its flavour to the articles laid on them; or, if such a wood cannot be got, the shelves ought to be painted in oil. The least expensive mode of fixing these shelves is by inserting their ends in the wall, or rather in the first coat of plaster; a better one is by fixing them to wooden bricks, but the best is by lining the walls with thin boards to which the shelves are attached. When shelves are put in by tenants, or temporary occupiers of houses, this last practice is sometimes adopted, for the sake of allowing the temporary occupier, at the expiration of the period of his occupation, to carry away with him his shelves, which in this case are no longer considered as landlord's fixtures.

587. *Of Seats and Basins to Water-closets, and of Cisterns for Water*, we have already said enough for this division of our work; and shall, therefore, not again recur to them, till we come to give designs for those of ornamental cottages and villas.

588. *Chimney-pieces* for the kitchens of cottages should generally be finished with stone facings and stone shelves; but, where the stone is sandy and brittle, it is much better to substitute stout shelves of deal or oak. The cottage parlour should, if possible, have a marble chimney-piece; and those of the bed-rooms may be of stone or composition. Designs will be found in our succeeding section, where we treat of fireplaces which may be executed either in marble, or stone, or composition; in the latter case, and even where freestone or slate-stone is used, they may be painted in imitation of some variety of marble. In countries abounding with slate of the kind which rises in large laminæ like that of North Wales, handsome chimney-pieces may be formed at very little expense, and painted so as to resemble either stone or marble. There are also chimney-pieces of cast iron, which are generally highly ornamented; and which are strong and durable when properly painted. The height of the shelf of the chimney from the floor is generally varied according to the width of the fireplace; but, in a cottage where the shelf is always turned to some use, its upper surface should generally be about four feet and a half from the floor; the projection of the shelf from the fascia, or face of the lintel, may vary from four to six inches, and its thickness should not be less than an inch. Where cast iron is used, and bronzed, so as to avow the material, the thickness of the shelf need not exceed half an inch, and the general design may be much more varied and enriched. Were the plan adopted of enclosing fireplaces in glazed doors, so as to prevent the heated air of the room from escaping by the chimney, and yet to show the fire, for which a patent was taken out by a gentleman of Edinburgh some years ago (see *Rep. of Arts*), and which has been recently recommended by Dr. Arnott, cast-iron chimney-pieces would be found very suitable.

589. *A valuable substitute for Portland stone chimney-pieces* is thus formed:—"Take two bushels of sharp drift sand, and one bushel of sifted slacked quicklime; mix them up with as little water as possible, and beat them well together for half an hour every morning for three or four successive days, but never wet them again after their first mixture. To two gallons of water, contained in a proper vessel, add one pint of single size made warm; a quarter of a pound of alum in powder is then to be dissolved in warm water, and mixed with the above liquor. Take about a shovelful of the first composition, make a hole in the middle of it, and put therein three quarters of a pint of the mixture of alum and size, to which add three or four pounds of coarse plaster of Paris; the whole is then to be well beaten and mixed together rather stiff. Put this mixture immediately into the wooden moulds of the intended chimney-piece, the sides, ends, and tops of which moulds are made of movable pieces, previously oiled with the following mixture:—Take one pint of the droppings of sweet oil, and add thereto one pint of clear lime water, made from pouring boiling water on lumps of chalk lime in a close vessel till fully saturated: when the lime water becomes clear, it is in a proper state to be added to the oil, as above mentioned, and on their being stirred together they will form a thick oily mixture or emulsion, proper to apply to the moulds. In forming the side or jamb of a chimney-piece, the mould is to be first half filled with the sand, lime, and plaster composition; then two wires, nearly the length of the piece to be moulded, are to be wrapped round with a thin layer of hemp, and to be placed in parallel lines,

lengthwise, in the mixture or composition in the mould: the mould is afterwards filled up with more of the composition; and if there is any superfluous quantity, it is to be struck off with a piece of flat board. The lid, or top of the mould is then to be placed upon it, and the whole subjected to a strong pressure from powerful levers, or a screw press. The composition should remain under this pressure for twenty or thirty minutes; the precise time necessary being guessed from examining the state of a small specimen of the composition, reserved purposely to determine the time it requires to harden and set firm. The sides of the mould must be held together by iron clamps and wedges. The wires above mentioned answer a double purpose, by giving strength to the jambs, and retaining the whole mass together, in case it should at any time be cracked by accident. These chimney-pieces may be made either plain or fluted, according to the mould; and when moulded, they are finished off by rubbing them over with alum water, and smoothing them with a trowel, and a little wet plaster of Paris. A common plain chimney-piece of this composition was sold at only 7*s.*, and a reeded one at 28*s.*, in London, in 1832, completely fitted up." (*Trans. Soc. Arts.*)

590. *Bell-hanging* may be described as the art of conducting lines of wire, intended to ring a bell at one end, when pulled with a little force at the other, in all directions round the apartments and through the walls of a building, in such a manner as not to obtrude on the view. This is effected with ease in straight lines; and angles are got over by what are called cranks, of which there is a variety of sorts for external and internal angles. As few bells can be required for common cottages, we shall defer what else we have to say on the subject till we come to treat of public-houses and inns; merely observing here, that a modern improvement consists in having the wires entirely concealed; and, in having a small wooden or ivory knob, protruding either from the plain face of the wall, or from the centre of a rose, a cup, or other ornament, instead of riband or string bell-ropes suspended from the ceiling. Fig. 520 shows a bell handle of this

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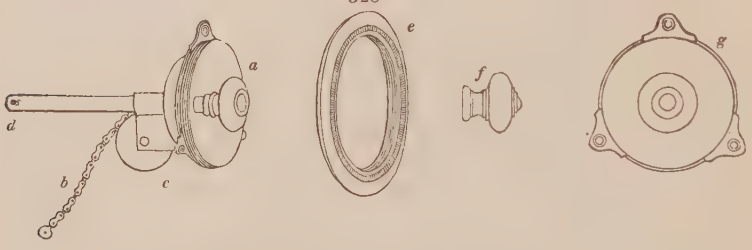

description, with its different parts: *a* is a cup, containing in the centre an ivory knob, by which is pulled the brass chain *b*; this chain passes over a pulley, *c*, and consequently may pull a bell in the direction of right or left, upwards or downwards, according to the side to which the pulley is turned; and when it is desired to pull the wire in a direction perpendicular to the face of the wall, the pulley is omitted, and the chain works solely in the groove *d*; *e* shows the outer rim of the cup unscrewed, in order to be cleaned if in wood, or new lacquered if in brass; *f* shows the ivory knob also unscrewed; *g* is the hollow of the cup, with the ears containing the holes for the screw-nails which fix it to the wall. The knob *f* is of ivory, and all the rest is of brass; but the cup might be made of ebony; or both cup and knob might be of bronze, or of iron painted to imitate bronze. The grooved bolt, *d*, in which the chain works, is generally made square, but it is here shown round, an improvement made by Mr. Nettlefold of London, which is found to make it work more truly and easily. The use of the grooved bolt is to guide the chain or wire, in pulling it out, and in letting it spring back again.

Sect. IV. *Designs and Directions for Fixtures for Cottage Dwellings.*

591. *The fixtures* for cottages we shall take in the order of kitchen ranges, cooking stoves, warming stoves, ovens, boilers, grates, sinks, fixed basins, fixed washing troughs, fixed ironing boards, and other flaps and slabs, towel rollers, dressers, and corner cupboards.

592. *Kitchen Ranges* are manufactured in Birmingham, and sent to all parts of the world, and their variety is almost endless. All of them, however, may be included in two classes; those that have neither boilers nor ovens, either at the sides or behind; and those which have either or both. It is of great importance to the cottager to know, that when he is obliged to choose a kitchen fire-place that has neither boiler nor oven in the side or jamb, he ought to choose a front and bottom grate only, and have the sides and back of his fire-place one solid mass of masonry, and if possible of fire stone or fire brick.

In every country there are clay stones to be found, so free from sand or lime as not readily to fuse; or clay so free from other substances as in like manner to resist the action of intense heat; and of one or other of these the backs and sides of all open fireplaces ought to be formed, where the object is to get the greatest quantity of heat from the smallest quantity of fuel, with the least quantity of labour. When the cottager can afford to purchase a range having an oven on one side and a boiler on the other, the kind which we consider the most suitable is that first made by Mr. Eckstein of London, fig. 521, in which the boiler occupies one side and the back, from *a* to *b*; and the oven is on the other side, *c*; the fire comes in close contact with both oven and boiler, and heats them sufficiently without the aid of a flue under the former. This range, on a small scale, may be purchased in London, by retail, for five guineas; the size here shown costs eight guineas. The oven, in this and other iron kitchen ranges, would be much improved by being lined with fire stone or fire brick; the heat would be thereby moderated, rendered more uniform, and retained longer. For roasting meat, there might be a grated false bottom, with a valve in the lower part of the door of the oven, and another in the back part of its cover, by which a current of air might be admitted at pleasure to brown the meat. There is a very small cast-iron range made occasionally, in which a stove for heating irons, and for other purposes, is substituted for a boiler, and which costs only three guineas.

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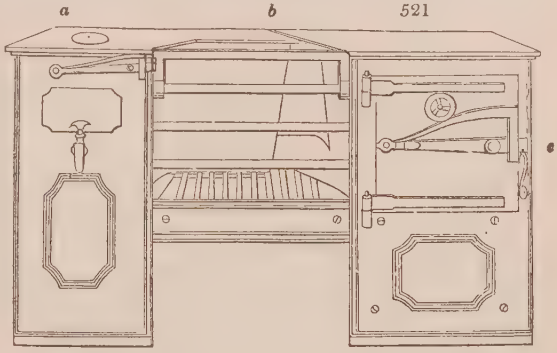

593. *A Design for a Cottage Kitchen Grate*, of great ingenuity, and capable of supplying all the heat required, not only for cooking, but for washing, warming, and every other domestic purpose, has been sent us by our scientific and gifted correspondent, Mr. Mallet, jun., of Dublin, who informs us that he has tried it, and found it to answer in every particular. Fig. 522 is a vertical section of this grate in the plane of the breast of the chimney; and fig. 523 is a plan, or horizontal section, of the same, taken a little above the bottom grate. The sides and back of the fireplace are formed by the

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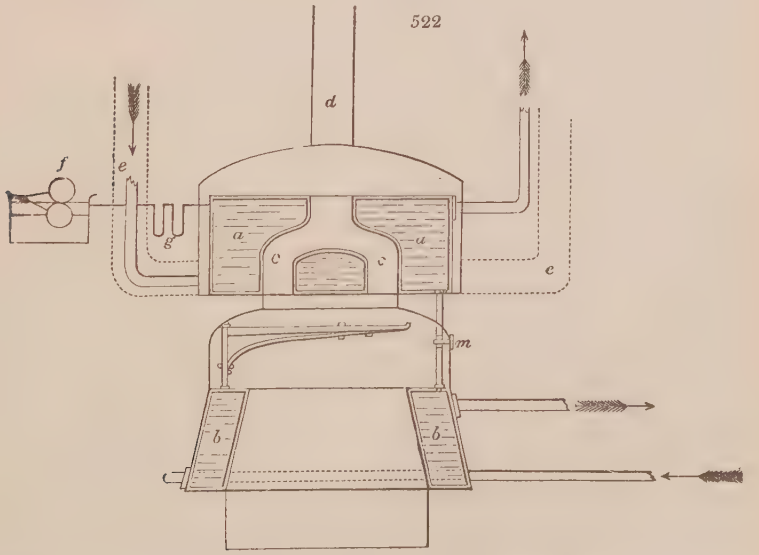

hollow vessel *b*, of boiler plate iron, into which two pipes are inserted to produce circulation between the water in it and that in the apparatus shown in figs. *524*, *525*, and *526*. The vessel *b* receives constantly that portion of the heat which would otherwise be dissipated in the brickwork of the back and sides of the fireplace, and transmits it to a hollow vessel, fig. *524*, enclosed in a cast-iron casing with doors, as shown in fig. *525*, which may form

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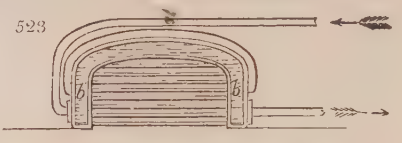

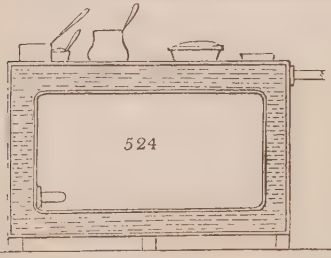

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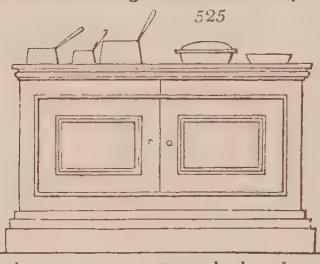

at one time an oven or hot closet, and at another a water or steam bath: the temperature of either of these, however, can never be higher than 212°, unless oil be used. The upper surface of this case will be useful for culinary purposes, most operations of which require but a moderate heat. Fig. *526* shows the top of the water-bath, with holes at one end for inserting saucepans, &c.; and with a hot plate at the other. This double-cased vessel is easily and cheaply made of boiler plates. Over the fireplace is another vessel, also formed of boiler plates, fig. *522*, *a*, the water in which is heated by that heat which generally escapes up the chimney, to the amount of half that evolved by the fuel. The flue passes in a circuitous route, *c c*, and the ordinary flue receives the smoke at *d*; but if the smoke passed off by the dotted lines *e e*, more heat would be given out, though in that case soot doors would be necessary in the chimney breast, opposite the angles of the flues, to admit of cleaning them. This boiler or vessel will heat part, or the whole, of the cottage, according to its size; it will supply hot water for culinary or other purposes; and when the vessel *b* is not in use, the heat of *a* may be greatly increased by opening the cock *m*, which will permit circulation to take place between the upper and lower vessels. The

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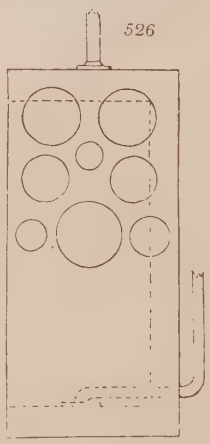

vessel *a* is supplied with water by a small cistern and ball cock, *f*, connected by the pipe *g*, bent to prevent circulation, and sunk into the wall of the chimney; a simple smoke-jack may be placed over the opening of the flue, *c*, as shown at *h* in fig. *527*; and a door of iron should be fixed in the breast of the chimney, a little higher up, as shown in the same figure at *i*, in order to get at the boiler at any time, and to sweep the chimney. Fig. *527* shows the elevation of the grate, which has a common crane, *k*, for hanging pots on; and two hinged cast-iron doors, *l l*, to turn back against the wall; by closing which the fire may be at any time intensely urged, and thus the water made to boil in both vessels in a few minutes (the cock *m* being open). By these means a bath may be procured in a very short time in any part of the house or cottage.

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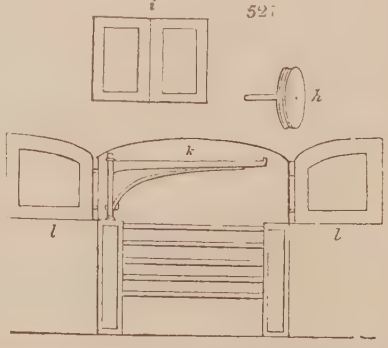

Of course many modifications and applications of this Design are practicable; such as heating a conservatory or a poultry-house, hatching eggs, steaming fodder for cattle, &c.; all of which may be readily conceived and executed by any practical engineer accustomed to direct works in iron.

594. *Cottage Cooking-Stoves* are not common in Britain, but they are much used in those truly economical countries, Holland and the Netherlands; and might, in many districts, prove of great advantage to the British cottager. We shall give a description of the stove in use in the cottages about Bruges, as furnished us by Mr. G. H. Cottam, who adds that these stoves will be manufactured, in future, at the establishment of Messrs. Cottam and Hallen, Winsley Street, London. Fig. 528 is a vertical section, showing the furnace or fireplace, *a*; the flue, *e*; and oven, *o*. Fig. 529 is another vertical section, taken at right angles with the former; and fig. 530 is a perspective view, show-

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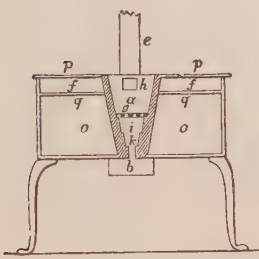

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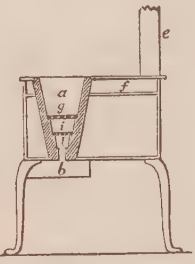

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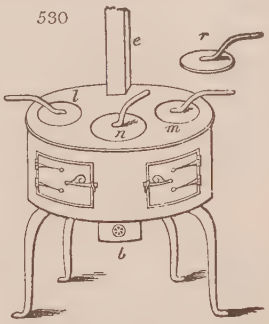
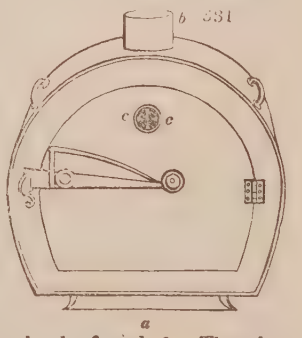


ing the external appearance of the whole. Near the top of the furnace there is a square opening, fig. 528, *h*, to admit the hot air and smoke produced by the consumption of the fuel, to enter into the flue, *f*, in which it circulates round the stove, between the plates *p* and *q*, before it escapes up the chimney, *e*. The oven, *o*, is heated from the furnace, *a*; which furnace, being closed at top, becomes red-hot, or nearly so, and produces sufficient heat for roasting, or any other culinary purpose. The size of the fireplace can be increased at pleasure by taking off the grate, *g*, and putting in a smaller grate to rest on the projections, *i*; or a still smaller one on the shoulders, at the bottom of the opening at *k*. The cinders and dust from the fuel fall into the box, *b*; which pulls out, in order to remove them, without producing the slightest degree of dust or dirt. Thus, while bread is baking in one oven, and meat roasting in the other, boiling or stewing may be carried on by saucepans set upon the cover, or in holes cut in it, having lids with handles, *r*, which lift off. One of these lids, *n*, is directly over the fireplace, and the two others, *l* and *m*, open into the smoke-flue. Irons may also be heated on this plate. These stoves will consume the most inferior description of fuel, and will produce an intense heat, from what would scarcely burn at all in a common open fireplace, where the fire is, as it were, drowned with air on all sides, instead of being, as it is in the Bruges stove, surrounded on all sides by heat, and the air supplied in one stream from below, through a valve in the front of the drawer for receiving the ashes. Most of our readers will agree with us in thinking that this stove, when it becomes generally known, will form a treasure to the British cottager, as it will not only serve to cook his meat, &c., but will throw out more heat for the purpose of warming his room, than any open fireplace whatever. The construction of this stove, in a scientific point of view, is admirable; and all that is necessary, in putting it up, is to set it on the floor, a few feet from the chimney (if one should be already built), and to conduct the smoke funnel of the former into the flue of the latter, immediately under the ceiling of the apartment, or, if the cottage contains two floors, it might be carried through to the roof, in order to heat the bed-rooms. When this stove is used as a substitute for a kitchen range, the open fireplace, or the throat of the flue over it, should be closed up, in order to prevent the escape of the heated air of the room. The fireplace, indeed, might be turned into a cupboard. We hope to hear of orders being given for hundreds of Cottam's Bruges stove; because they would not only serve instead of all other kitchen fires for common cottages, but would prove a useful auxiliary to the kitchen in most houses. It would be easy to make an improvement on this stove, so as to circulate hot water from it all over a house, for the purpose of heating it; thus rendering open fireplaces totally unnecessary, and doing away, in ordinary-sized dwellings, with all the chimney-flues and chimney tops, except one.

595. *Warming-Stoves* are of endless variety. Those manufactured in Britain are generally of iron; and for the consumption of pit coal they are erroneous in one important particular, viz. that of not being surrounded by fire brick or fire stone, to serve as

a reservoir of heat. Were this done, or were even a double vacuity of air formed around, above, and below the furnace of a stove, by plates of iron, a great deal more heat might be procured from the fuel; because nearly the whole of the smoke might be consumed: all the difference would be, that the heat, instead of being radiated directly from the stove into the air of the apartment, would be radiated from the flue; and this flue, being of iron, might be conducted so as to heat several apartments, or the whole house. A good and cheap construction for this purpose is still wanting. A stove invented by Witty effectually consumes the smoke; but it is bulky, the fuel is supplied in an awkward manner, and the stove itself is rather too expensive for our present purpose.

596. *Cottage Ovens* are formed of either iron, fire stone, or fire brick. The two latter kinds are by far the best; because they do not, like iron, acquire suddenly so much heat as to burn what is to be baked or roasted in them; and because they retain the heat they do acquire for a long time. An excellent oven is formed by cramping together five square fire stones or fire bricks, of a foot or more in breadth each, and having a sixth stone or brick as a cover. The fire may be made within, and taken out when the stones are thoroughly heated. This oven may be fixed by the side of a kitchen fire, or set on a weak fire, as practised with a description of stone oven in use among the cottagers in Gloucestershire, and with clay ovens at Dunstable, in Bedfordshire. Excellent ovens of this sort might be made of Stourbridge fire clay; and Mr. Peake of Tunstall informs us, that not only ovens for baking bread, but entire fireplaces, with their flues, might be made of the same material, at a very moderate expense, if it were not for the present enormous duty. A fire clay fireplace, with an oven on each side, and requiring no ironwork, except a small grating in front and another at the bottom, would be a most desirable fixture for the cottage kitchen.



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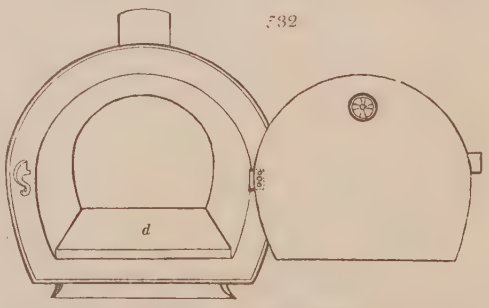
597. *Portable Iron Cottage Ovens* are common among the ironmongers, but they are not very desirable. Occasionally, however, they may be useful where nothing better can be got, and we shall therefore briefly notice two kinds. Fig. 531 is a front view of a portable wrought-iron cottage oven, which costs in London, by retail, 30*s*. It is intended to be placed over a fire, so that the smoke and hot air may enter at *a*, circulate round the oven, and escape by the funnel, *b*. There is a valve, *c*, to permit the escape of steam when meat is roasting. Fig. 532 shows a view of the oven with the door open, and with a false bottom, *d*, of fire stone, raised half an inch from the iron bottom, to moderate the heat. The dimensions of the chamber are, depth and height, thirteen inches and a quarter, and width fifteen inches. Another portable oven is nothing more than a common cast-iron flat-bottomed pot or stewpan, with a false bottom inside supported on pivots, under which sand is put, to diminish the intensity of the heat. When this oven is to be used, it is put on a moderate fire, and covered with a lid, which may be taken off occasionally to admit air. The cost in London, by retail, is only 3*s*. 6*d*. It will bake a small loaf, or roast a fowl.



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598. *Boilers for Wash-houses* are commonly made of copper, and require little art in either making or managing, except, in setting them up, to provide for getting as much heat as possible out of the fuel burned beneath them; and to get ready access to the flues, to free them from soot. In all open boilers, as usually constructed, there must necessarily be a great waste of heat; and therefore, in cottages, we always desire to contrive the flues proceeding from them so as they may heat the air of the apartments.

599. *Parlour and Bed-room Grates* are manufactured in iron in the greatest variety; but it may truly be said that there is not one in a hundred of their forms worthy of being recommended, as being scientifically constructed, with a view to the complete consumption of the fuel used, and the radiation of heat into the room. The grand error of almost all of them

consists in their being exclusively constructed of iron. We hope the day is not very far distant when open fireplaces will be considered as relics of barbarism, and will be altogether banished from every room in British houses, except the kitchen: in the mean time, we recommend the cottager who persists in indulging his prejudice for the sight of an open fire, to form the sides and back of his fireplace with fire brick or fire stone; and to use no iron whatever in its construction, but four bars for a front to the fuel chamber and a bottom grate, which, together, in cast iron, will not cost more than 3*s.* or 4*s.* The most convenient fire bricks are what are called Welsh or Stourbridge lumps, from the names of the places where they are made; that is, masses of burnt clay, eighteen inches or two feet long, nine inches or a foot broad, and six or eight inches thick. One of these may form the back of the fireplace, and two others the two sides, as in fig. 533; in which *a*

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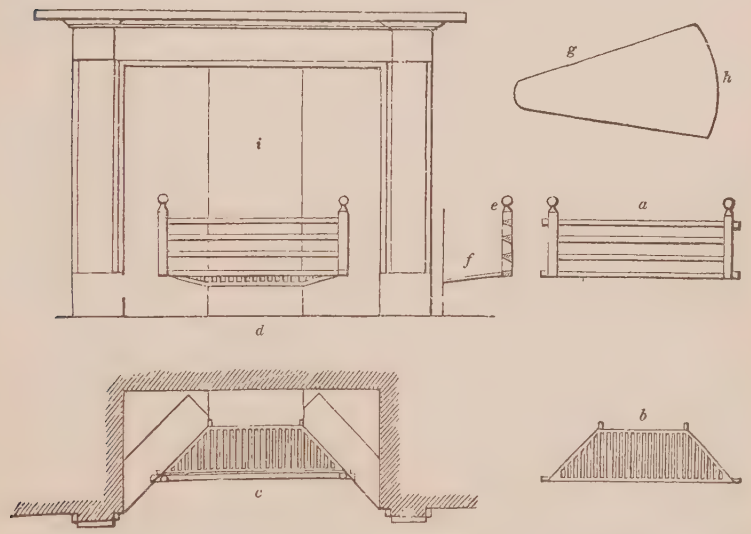

represents the front bars; *b*, the bottom grate; *c*, the plan of the fireplace, the bars, grate, and Welsh lumps being shown in their proper places; *d*, the elevation; *e*, the section of the front bars, and the bottom grate, showing the inclination of the latter, *f*, towards the back of the fire chamber, in the proportion of about one inch in six, with a view of giving the ashes a tendency to the back; and *g*, a section of one of the front bars, of nearly its full size, showing the upper surface inclining towards the back of the grate, in the proportion of half an inch to an inch, *h* being the front of the bar. The nearer the fuel-chamber is placed to the hearth, the more heat will be radiated into the room from the increase produced in the space, *i*, between the grate and the chimney breast; and, on the contrary, the nearer the fuel chamber is to the chimney breast, the less will be the heat radiated into the room, though the chimney will draw better. The Welsh or Stourbridge lumps at the sides should form with those of the back an angle of forty-five degrees or upwards. In a fireplace of this sort a fire is much more easily lighted, and much less liable to go out when neglected, than in one having the back or sides of iron. It also consumes the fuel much more effectually; and, by not radiating the heat so rapidly from its surface as iron, it creates less draught up the chimney, and consequently carries less heat out of the room. When the mass of fire brick is once thoroughly heated, it retains heat for many hours after the fire has been extinguished; so that, if the fire is at any time suffered to go out from neglect, the room is not so soon cooled as it would be, under similar circumstances, by the radiating and conducting powers of cast iron. Where the grate is raised somewhat higher than is shown in fig. 533, a drawer may be added to the front bars, and bottom grate under the latter, for receiving the ashes, so as to prevent them from raising a dust, by falling from the bottom grate to the hearth, and at the same time to retain more heat about the fire. The ashes may also be carried away in the drawer, in furtherance of the same object; and by drawing it out more or less, or keeping it closely shut, the burning of the fire may be accelerated or retarded. As a further means of preventing the ashes from falling from the front bars on the hearth, the upper

surface of the former should always be made to slope inwards, as before stated, and the breadth of the bars should be somewhat greater than is usually employed. This is shown in fig. 533, *g*, and also in the section, fig. 534, to a scale of a quarter of an inch to a foot, in which *k k k* are the sections of the bars; *l*, the bottom grate; and *m*, the ash-drawer. The front bars should always be straight, because the consumption of the fuel depends on its being as little exposed as possible to cold air on the sides, and because the heat given out to the room depends on the breadth of surface of the ignited fuel, and not on the depth of the fuel chamber. Curved fronts, therefore, for fireplaces of this sort, are never to be recommended; not only because they increase the depth of the fuel-chamber, but because they expose a greater portion of the fuel to the action of the cool air, by which perfect combustion is rendered more difficult. With the fireplaces near the hearth, with front bars beveled inwards, and with an ash-drawer, the fender may be made very low; and thus the heat may be allowed to radiate freely to that part of the floor from which it is excluded by a high fender. It is necessary to observe that the bottom or ash-drawer is not recommended as a means of increasing the heat, because its front and bottom will prevent a portion of that from being radiated to the hearth, but chiefly as a means of regulating the draught of air through the fire, and consequently of accelerating or diminishing the consumption of the fuel; and partly for the sake of cleanliness, in preventing the small ashes from falling on the hearth, and avoiding the dust which in that case arises when they are swept up and carried away.

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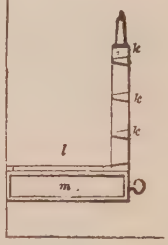

600. *A simple and economical Fireplace* for a cottage parlour the chimney of which is liable to smoke, is in use in some parts of Fifeshire and Mid-Lothian, and is worthy of imitation in countries where fire stone or fire clay can be readily procured. In the cottages alluded to, the sides or jambs, figs. 535, 536, *n n* (between which are fixed the front bars and the grate), are formed of a kind of fire stone, found in the island of Cramond: the fire-chamber is wide in front, but not deep; in consequence of which it consumes but few coals in proportion to the heat it throws out. The upper part of the fireplace, behind, and at the sides, is formed of the same stone; and in front there is fixed a cast-iron plate, with an opening in it; which, though generally semicircular, might be made square, or Gothic, according to the character of the architecture of the house. These fireplaces are valuable for low-roofed cottages placed among high trees, as the chimneys of dwellings so situated are very apt to smoke. Fireplaces thus constructed draw well; but it must be obvious that, in proportion as this is the case, a greater amount of heat must be carried up the chimney. A thin plate (generally of sheet iron) is sometimes hooked on in front of the opening, on first lighting the fire, in order to increase the draught, by preventing the cold air of the room from mixing with the heated air that has passed through the fire. In Ireland, we are informed by Mr. Buchanan, in his *Economy of Fuel*, p. 315, that, instead of using a cast-iron plate, the back of the upper part of the fireplace is formed into an oval niche, by fire stone or fire brick; the breast of the chimney being rounded off, and the throat very much contracted. A view of such a chimney is given in an excellent work, entitled *The Theory and Practice of Warming and Ventilating*, &c., p. 183. We can only recommend such fireplaces, however, as a minor evil to that of a smoky chimney. The grate, fig. 535, and the preceding one, fig. 533, have one disadvantage for the cottager, common to both, viz., that of having no hobs; but this want may be supplied in the present grate, by omitting the cast-iron plate, when the tops of the jambs would become hobs, as is actually the case in the parlour fireplaces of cottagers about Edinburgh;

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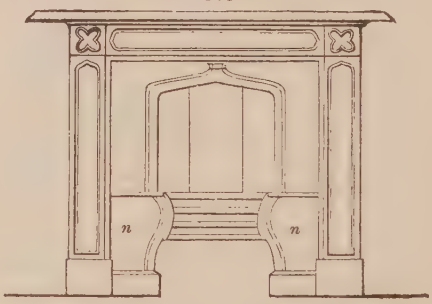

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and hobs might be supplied to the grate, fig. 537, having the sides of the fire at right angles to the front, as indicated in fig. 538, in which *o o* are the hobs, formed of Welsh lumps, or fire stone; *p p p*, Welsh lumps forming the sides and back; and *q q*, angles filled up with mortar, or fragments of fire brick. In such fireplaces as fig. 533, a substitute for a hob may always be found in the movable bracket called a trivet, for hanging on the bars; or by a similar stand with three feet, for setting before the fire.

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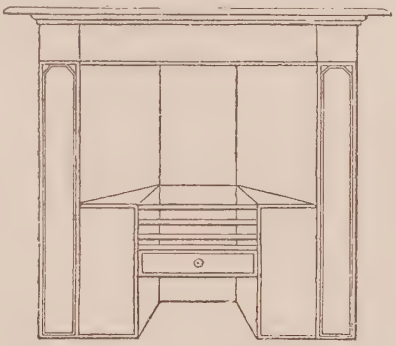

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601. *An economical union of cast iron and fire stone or fire brick* is sometimes attempted by ironmongers, by lining iron cases with stone or brick, as in fig. 539; in which the front plates of the jambs, *r r*, and the plates which form the hob, *s s*, are of cast iron; and the back and sides are also of iron, but lined with three fire stones, *t t t*. The iron back and sides are of no other use than to retain the stones in their proper places, and thus render this fireplace portable, and, in consequence, an article of trade for ironmongers; since a much more effective and less expensive fireplace would be produced by having only the covers of the hobs, the front plates of the jambs, and the bottom grate, of iron, and building up from the hearth, the jambs, and the back, of solid masonry, and on that placing the firestone. A grate built in this way is both economical and handsome, more especially if it has broad beveled front bars and an ash-drawer, as shown in figs. 534 and 537; but, as Mr. Tredgold observes, "ironmongers, in general, seem to think it more desirable to use iron, than to economise fuel, or to work on sound principles." In the neighbourhood of Birmingham, and in the coal districts of the midland counties, where coal is abundant, and the inhabitants are fond of large bright fires, the bottom grates are made so wide that cinders of considerable size are allowed to pass through them. To prevent these cinders from being lost, and also to prevent dust from being raised, by sweeping up and carrying away the ashes, what is called an ash-pan is often placed on the hearth between these fire jambs, immediately beneath the grate. This ash-pan, fig. 540, is a frame or box, with a grated top and a drawer underneath. The open spaces in the grating are about a quarter or three sixteenths of an inch apart, which is the width between the bottom bars of grates about London, and in most parts of the country where fuel is scarce and dear. In some places, the drawer or box is let into the hearth, and the grating over it is formed of brass wire, which gives a remarkably clean and warm appearance to the hearth, as no ashes can lie on the wires, which, from the reflection of the fire over them, present a glowing hue to the eye. Where provision has not been made for this recess in the hearth, the same effect may be produced by a box over it, the outer rim of which should form the fender, which will look better, and be more effective, than the ash-pan, fig. 540, which only receives the ashes that fall directly under the grate; leaving those which fall from the front bars to be swept up. By having the whole of the hearth within the fender formed of one shallow box, of which the fender is the outer rim; by having this box covered with brass-wire grating, and the front bars sloping inwards, no ashes could ever be

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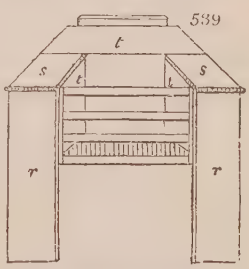

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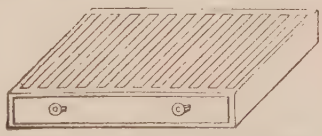
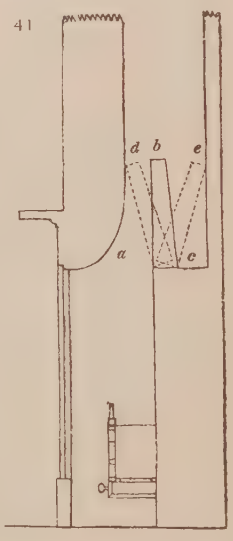
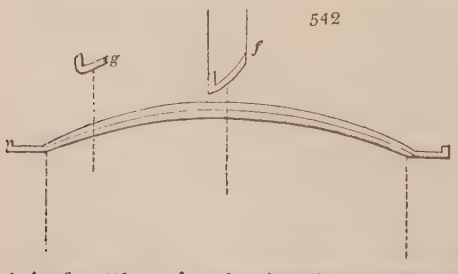
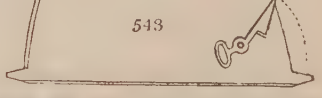


seen. In kitchens on the ground floor, it is a common practice, in many places, to leave an ash-pit under the kitchen range, three or four feet deep, covered with a wrought-iron grating, into which the ashes fall, and are only taken out when it is full, generally when the chimneys are swept. This practice is highly commendable, as saving the labour of daily carrying out and sifting the ashes, and bringing back the cinders.

602. *The rounding of the chimney breast, and the contraction of the throat of the flue*, whatever may be the kind of grate adopted, are points which contribute materially to the free draught of every chimney. The chimney breast requires to be rounded, in order to direct the current of cool air drawn from that of the room gradually upwards, so that it may mix in by degrees with the current of hot air ascending from the fuel chamber, instead of striking against it at right angles, which it must necessarily do when the chimney breast is not rounded. The object of contracting the throat of the chimney is to diminish the quantity of heat drawn from the room, by the current of air which is continually passing up the chimney; but the same contraction, it is justly observed by Mr. Tredgold, often augments the draught to such a degree, as greatly to increase the consumption of fuel. The grand point to be attained is, such a draught as will do nothing more than carry off the smoke, and keep the fire clear; because then there is the greatest radiation from the fire and fireplace, with the least waste of hot air from the room. The rounding of the chimney breast may either be effected by having a stone lintel or a cast-iron one. In countries where stone is so abundant that lintels of that material are thrown across the openings of the fireplaces, the under side may be rounded off as at *a*, in fig. 541, and the throat of the flue gradually contracted (as shown in the section from c to d, p. 113.), till, at the height of two or three feet from the chimney breast, the superficial area, in ordinary cases, is not more than 90 or 100 square inches; this being found by experience to be a suitably sized flue for an ordinary coal fire. When this contraction has been neglected in building the chimney, or done improperly; or when it is found necessary to contract the throat still farther, to create a draught; this may be done, in stone countries, by the piece of flag-stone, *b*, set on the surface, *c*, which may be moved backward or forward to adjust the draughts to the degree required. When fires are no longer wanted, this stone may be brought forward so as to lean against the breast of the chimney, as at *d*, to close up the flue; or thrown back, as at *e*, when the chimney is to be swept. That this may be done with ease, and without dirtying the hands, the stone may be removed by inserting the points of the tongs in two holes cut in its face for that purpose. In countries where brick is the principal building material, the chimney breast, as we have seen, § 79, is built on an iron bar: this bar is generally flat, and about three inches broad; consequently its inner edge presents a sharp angle, instead of the rounded surface represented in fig. 541: to remedy this, a bar has been invented by Mr. Chadley, fig. 542, the cross section of which, taken at the centre of the opening, is shown at *f*; and another cross section, taken nearer the end, is shown at *g*. This is obviously an excellent bar, and its cost, for an opening three feet wide, is not more than the usual expense of a common wrought-iron bar, suitable for the same opening. The contrivance for contracting or closing the throats of chimneys, in brick-built buildings, is either by a plate of cast iron, formed with a base so as to stand like the stone,







b, in fig. 541; or by what is called a register plate, fig. 543. In the latter case the plate is furnished with a turn latch, which may be worked by the tongs, so as to regulate the distance between its upper edge and the breast of the flue. It may

be taken out to admit of sweeping the chimney; or the flue may be completely closed by it. "When the chimney top is properly contracted," Mr. Tredgold observes, "a register at the throat is not wanted, and it is always desirable to do with as little machinery about a fire as possible." He says that he makes the contraction at the top in order to reduce the opposition which the wind, and even the resistance of the air, make to the ascending smoke; also to prevent the chimney from being cooled by double currents of air (which is often the case in wide chimneys), and to diminish the loss of heat which would be required to sustain a current of smoke in a large flue. If the contraction were made only at the throat, the force of ascent would be diminished at the first effort; it would be like contracting the aperture of a pipe which supplies a jet; besides, if a larger opening were left at the top than what is absolutely necessary, the rain, cold air, &c., would descend, and interrupt the smoke. The degree of contraction at the throat of the flue Mr. Tredgold makes the same as that at the top of the chimney. He avoids all abrupt changes in either the form or direction of the flues; he prefers the circular form for them; and in 1816 proposed, in the *New Monthly Magazine*, to build them of earthen pipes.

603. *The American Stove* is adapted for a cottage in a country where wood is the fuel, where it is abundant, and where no great nicety of construction has yet entered into cottage dwellings; but it can never be recommended as so economical in the first cost, or so neat and cleanly in use, as a fireplace with the back and sides of non-conducting earthy material. It is formed entirely of cast iron, and has a large projecting cast-iron hearth, with a rim to it, serving as a fender; it has also sides serving as jambs, and a hood or shelf of cast iron. The fuel is burned on three or four iron bars, resting on dog-irons.

604. *Many other Stoves suitable for Cottages* might be described and figured; but we have deemed it more likely to be useful, to confine ourselves to two or three which we are perfectly certain are excellent, and which are fit for first-rate houses no less than for cottages. The fire-brick stove, fig. 533, is to be found in the libraries and business rooms of some of the largest mansions in London; for example, in Portland Place and St. James's Square.

605. *The Consumption of the Smoke in open Fireplaces* has long been a desideratum: and though it never can be accomplished effectually, it may in a great degree, by the use of a stove invented by Cutler, in which, instead of throwing coals on the top of the fire, in the usual way, they are supplied from beneath, by hoisting up a grated box, into which as many coals are put in the morning as it is supposed will be burned during the day. The invention is rather too complicated for common cottages; but, if a little trouble were not objected to, at least the grosser portion might be consumed by the following arrangement: — Supposing the bottom grate of the fuel chamber, as in fig. 533, to be within six inches of the hearth, all that is necessary is to char the coal by keeping it a day directly under the grate (with a good fire burning above), before it is used. The space below might be divided vertically into two chambers, and each sunk so deep into the hearth as to contain as many coals as would be used in a day. The bottoms of these chambers should have an ash-box fitted into them, into which the ashes and dross would fall when the coals were being lifted with a shovel to be put on the fire. Every morning one chamber would be found empty, or nearly so; and the ash-grate, being taken out, and its contents thrown in the dusthole, might be replaced, and the chamber again filled with coals. The coals might also be charred by having the jambs hollow, and the hobs to lift up; or by leaving a hollow in the back directly behind the fuel chamber, with a cast-iron door: but though these two modes would be much more cleanly than the other, they would not, like it, have the advantage of burning whatever was evaporated from the coals. It would be impossible for a quantity of raw coal to remain a whole day directly under a good fire, without being in a great measure deprived of the watery particles and grosser carbonaceous matters which are the principal ingredients in smoke; and equally impossible for this vapour to escape without passing through the ignited mass of fuel over it. We do not present this as either a perfect or an elegant mode of burning smoke in open fireplaces, but as one which may be universally adopted; and which, whether it succeeds in effectually consuming the smoke or not, is sure to do good, since the drier and hotter fuel is, before it is put on the fire, the better it will burn.

606. *Designs for more elegant Grates and Stoves* will be found among our fixtures for ornamental cottages and villas; and we shall treat more at length on the principles of warming and ventilating, in the Third Part of this work.

607. *Sinks*, or fixed shallow troughs, are usually placed in back-kitchens, sculleries, and wash-houses, for setting dishes and other articles upon which are to be washed; and for receiving and conveying away dirty water. They are generally formed of stone, fig. 544, but are sometimes also made of cast iron; and Mr. Mallet of Dublin, who

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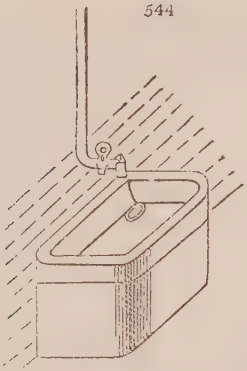

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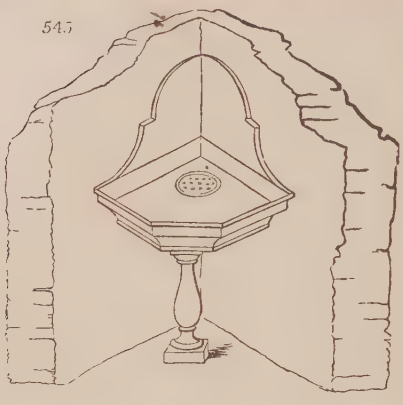

has made a great number, has sent us several Designs, of which fig. 545 is a corner sink, suitable for cottages. Sinks are also frequently made of wood, lined with lead or zinc. A sink, of whatever materials it may be constructed, should always either be raised on masonry, or placed on an iron or wooden stand, so as to have the upper edge about two feet and a half from the ground; and it should be fixed near a window, on account of the light. Where practicable, there should be a cock with a supply of water immediately over it; and, at all events, there should be a waste-pipe from it, leading to a drain, the orifice being protected by a bell stink-trap, as already described, § 237.

608. *Fixed Wash-hand Basins, Washing-Troughs, and Slabs* are little required in plain cottages; we shall therefore defer what we have to say of them, till we come to treat of fixtures for villas. Fig. 545, given as a corner sink, would make a very good fixed wash-hand basin.

609. *A Towel Roller* ought to be placed on the back of the kitchen-door of every cottage; or, if not on the back of the door, it should be near the sink or fixed wash-hand basin. It is formed of deal, or any common wood, fig. 546, to a scale of one inch

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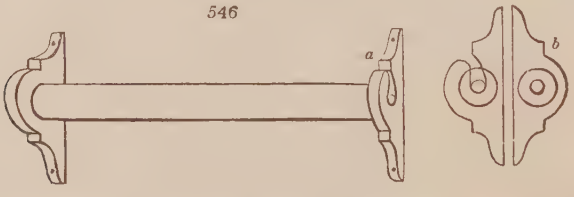

to a foot, and consists of a roller with a gudgeon, or small pin, at each end, which pins work in sockets cut out of brackets fixed to a door, or to any other perpendicular surface. One of these brackets, *a*, has its socket cut through, to admit of taking out and putting in the roller, when the towel requires to be changed; the other, *b*, has merely a circular hole cut into one side.

610. *A Rail for Towels*, fig. 547, to a scale of an inch to a foot, is a fixture suitable for

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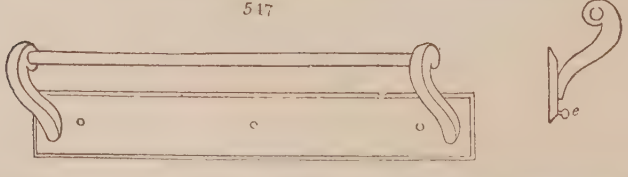

either bed-rooms or kitchens: it requires no description beyond the inspection of the figure; and may be nailed to a wall, to a door, or to the side of a wardrobe or chest of drawers. This rail should be made of strong wood, and painted of the same colour as

the walls or door of the room, or the wardrobe against which it is fixed. The use of the paint is not only to harmonise it with the rest of the apartment, but to preserve the wood from being first discoloured, and afterwards rotted, by the wet and damp of the towel. If it should be fixed against a papered wall, and near a wash-hand stand, a row of wooden pins or buttons, *e*, may be placed in the under side of the rail, on which may be hung a curtain of brown holland linen, or of any other material, to prevent the wall from being splashed.

611. *Hat and Cloak Pins* are sometimes formed of wood, turned or plain, and let into a rail of the same material; this rail being fixed to the wall, in the entrance lobby or passage, or sometimes in cottage bed-rooms. The more common pins for this purpose are made of cast iron; and figs. 548 and 549 show two of the most useful shapes: the latter answers two purposes, as a cloak may be hung on *d*, and a hat on *e*.

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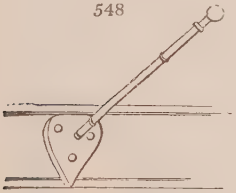

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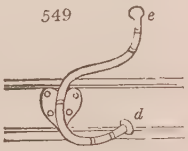

612. *An Iron Hand-mill*, for grinding coffee, rice, barley, and groats, and another smaller one for pepper, &c., are most valuable articles in the better description of cottages; because the cottager may not only roast and grind his own coffee, or any of the substitutes for it, but he may, at pleasure, form rice flour from whole rice, for puddings, &c., for invalids or children; barley flour from pearl barley, for fever drink; or oatmeal from groats, for porridge or gruel. These mills are always easies to work, and most effective, when fixed; and for this purpose, if there be no style of a door or quarter of a partition sufficiently strong, they must be bolted to the wall, unless provision was made in building it, by inserting a piece of strong timber, or a stone to which the mill could be cramped with lead.

613. *Fixed Ironing-Boards and Flaps* are useful both in kitchens and, on a smaller scale, in lobbies and passages, and even sometimes as brackets in sitting-rooms. Fig.

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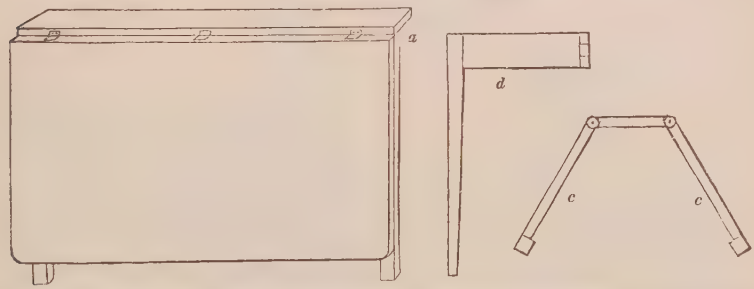

550 is an ironing-board, or flap table, which, in a cottage, may serve for various useful purposes, and, where the living rooms are small, will be found a most valuable substitute

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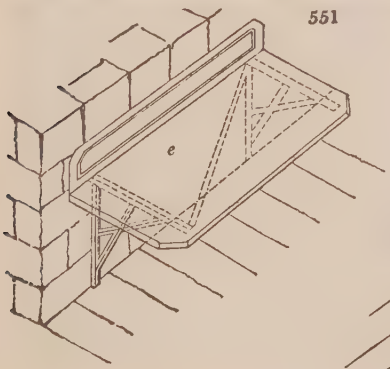

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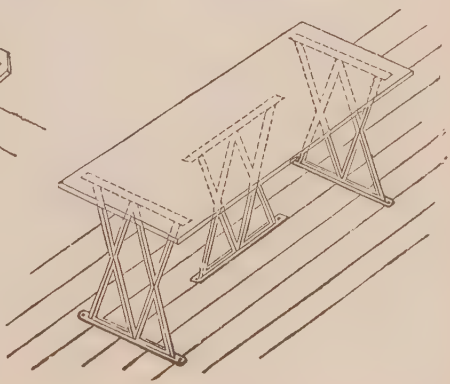

for a portable table. The piece of board, *a*, is made fast to the wall, either by holdfasts, or by being nailed or screwed to wooden bricks. The flap, *b d*, is hinged to it, and, when raised up, is supported in its place by the hinged folding legs, of which *c c*, fig. 550, is a plan, and *d* an elevation. Fig. 552 is an insulated fixed table, or ironing-board, supported by cast-iron framing, which is fixed by screw nails to the floor, and also to the under side of the top. Mr. Mallet, junior, of Dublin, who has sent us this Design, observes that all manner of kitchen tables may be supported in this manner, most securely and firmly, and at very little expense. Fixed insulated tables occupy more room than wall flaps; but in roomy cottages, and especially where the mistress is a washer-woman, they admit of two or four persons ironing at the same time, instead of one or two. Fig. 551 is an ironing-board, or side-table, supported by cast-iron brackets; the dotted lines showing the general disposition of the framing to support the table, and the diagonal rib, *e*, introduced to prevent lateral action. Figs. 553 and 554 show two modes of fastening sideboard framing to walls; the first by an eye-bolt, with a round key, passing through holes jumped (the expression for boring stone with a blunt chisel, called a jumper) in two superincumbent stones in the wall; the latter shows the bolt passed through the wall, and secured with a nut. Fig. 555 is a sideboard suitable for a lobby, wide passage, or dining-parlour. The board or flap, *f*, is hinged at the joint, to fall down, and is supported by two jib brackets, fig. 556, which

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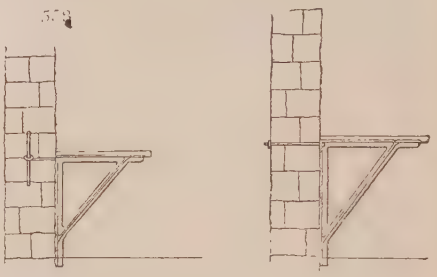

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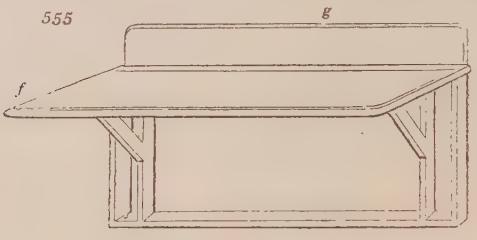

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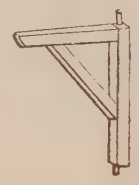

shut into the frame when the flap is let down, and are concealed by it. There is a slip of board, *g*, above the flap, to keep things from rubbing against the wall. In the construction, the brackets are fixed to the frame, by having round pins worked in both ends of their upright piece, which turn in corresponding holes of the top and bottom rails of the frame.

614. *Dressers* are fixtures essential to every kitchen, but more especially to that of the cottager, to whom they serve both as dressers and sideboards. They are generally made of deal by joiners, and seldom painted, it being the pride of good housewives, in most parts of England, to keep the boards of which they are composed as white as snow, by frequently scouring them with fine white sand. The dishes, plates, &c., which they contain are also kept perfectly clean and free from dust, by being wiped every day, whether used or not. In old farm-houses, the dressers are generally of oak rubbed bright, and the shelves are filled with rows of pewter plates, &c., polished by frequent cleaning, till they shine like silver. The dresser may be called the cottager's sideboard, and in the dining-rooms of the first nobleman's houses in Britain, the splendid mahogany sideboards, set out with gold and silver plate, differ only in the costliness of the materials employed from the cottage dresser: nor do the essentials of human food differ more in the palace and in the cottage than the furniture; for, in Britain and America at least, good meat, good bread, and good potatoes are the main dishes on all tables, and may be obtained by the workman who has good wages and full employment, as well as by the wealthy merchant or hereditary aristocrat. When there is a pot-board affixed to the dresser, it is usually painted black or chocolate colour; and when the shelves and fronts are painted, it is generally white, or, what is in better taste, the same colour as the walls or doors of the apartment. Gothic dressers would be more appropriate if made of oak, or painted to resemble that wood. The price of a deal dresser, in London, is from £2 to £5.

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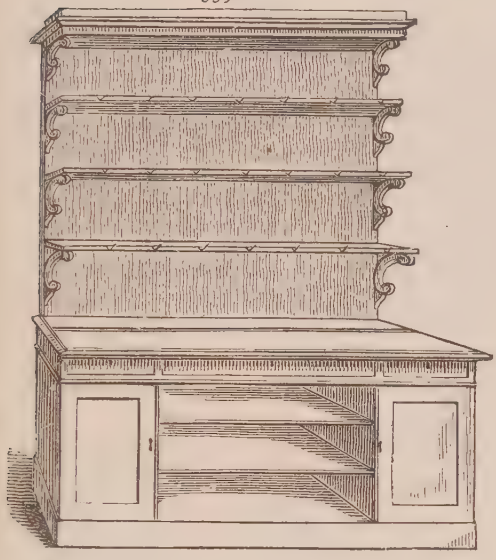

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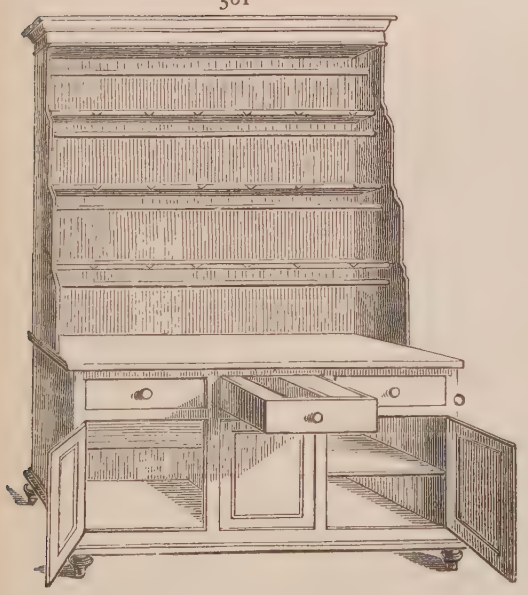

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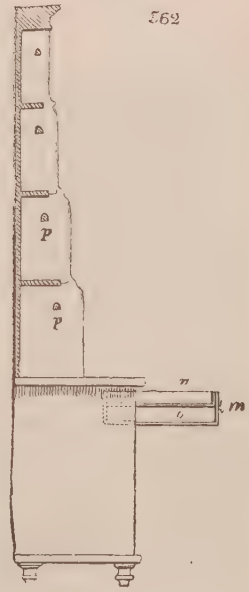

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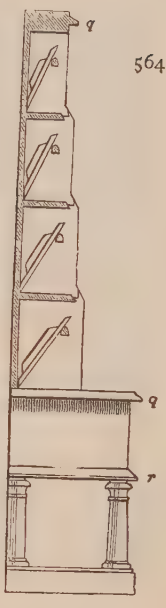

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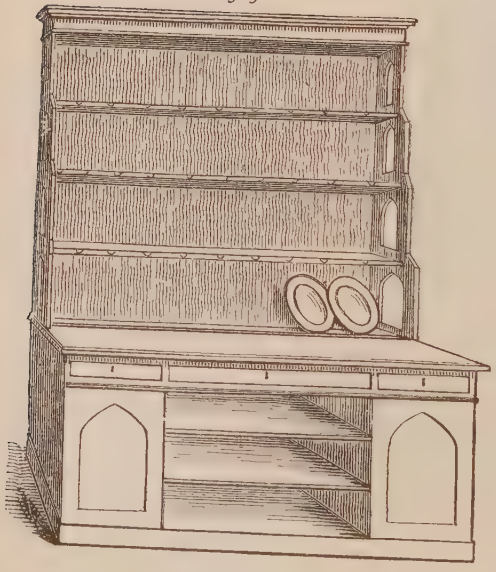

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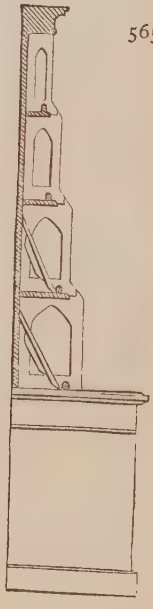

615. *Dressers in the Grecian Style.* Fig. 557, on a scale of three eighths of an inch to a foot, represents a dresser in a plain Grecian style, the characteristic features being the square columns which support the drawers, and the board or table which covers them: under the drawers is seen the potboard, or place for setting pots, saucepans, &c., when not in use. There are three shelves, and two large drawers. Rails are fixed a few inches under each shelf, on which to rest the edges of the plates and dishes, in order that they may lean forward, so as to protect their faces from the dust, which, when they are in this position, can only fall on their backs. There are hooks fixed in the edges of the shelves, on which jugs and any small articles having handles may be hung. Fig. 558 is

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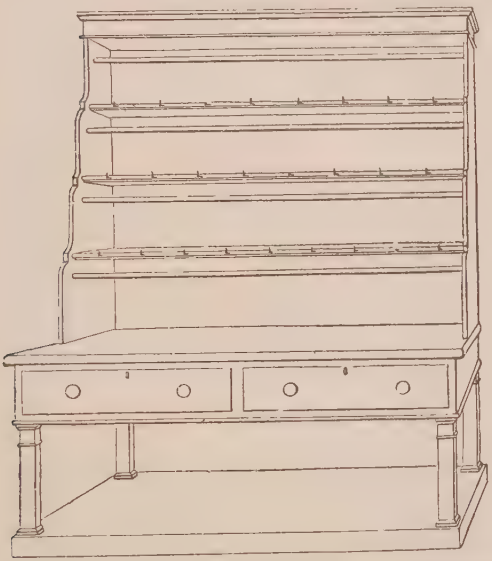

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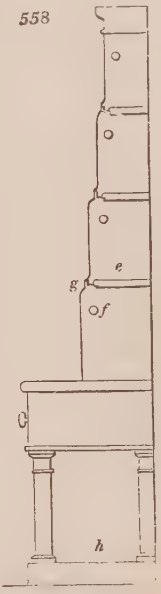

a cross section of this Design, on a somewhat larger scale, on which are shown the ends of the shelves, *e*; of the plate rails, *f*; of the hooks, *g*; and of the potboard, *h*. Fig. 559, p. 295, is another dresser in the Grecian style, but differing from the other, in having beads fixed along the upper surface of the shelves, near the edge, to support the plates and dishes in a reclining position against the back. In this position they are liable to receive the dust on the face; but it is nevertheless preferred by some housewives, as showing better whether or not the plates are clean. Instead of an open potboard, there are two side-closets, and, in the middle, shelves. There are three drawers above: the centre one for tablecloths, towels, &c.; and the two side ones, one for knives, forks, and spoons, and the other for dusters, brushes, &c. In one of the cupboards below may be kept what wines or spirits are in daily use, glasses, &c.; and, in the other, bread, biscuits, groceries, or any other articles of food. The tea-tray and teacups may be put on the upper middle shelf, and the smaller saucepans, &c., on the bottom one. Fig. 560 is an end view of this dresser, on a somewhat larger scale, in which the ends of the beads, *i*, the hooks, *k*, and supporting brackets, *l*, are more distinctly delineated. The top of this dresser, being somewhat heavy, should be fixed to the wall by two holdfasts driven in above so as to be concealed by the cornice, or by screw nails to wooden bricks. Fig. 561, also to a scale of three eighths of an inch to a foot, is a very convenient dresser, used in the better description of cottage dwellings in Cambridgeshire. The middle drawer, which is shown drawn out, has a lift-out box or tray, which is divided in the centre for the knives and forks, and spoons, in daily use; and underneath, in the bottom of the drawer, is a space in which are kept those not generally in use. There are two other drawers, one on each side, for clean tablecloths and towels, and for dusters, &c. The cupboard in front is made, in order to look uniform, with three panels like doors, but the centre one is fixed, and behind it, in the middle, is a division forming the whole into only two cupboards, in one of which may be kept glasses, teacups, &c.; and in the other, the liquors, fruits, sweetmeats, &c., in daily use. Fig. 562 shows a section of the

dresser, in which is seen the middle drawer, *m*, with its lift-out tray, *n*, and the space below, for knives and forks not in use, *o*. This dresser being intended to have the plates leaning forward, as in fig 557, sections of the plate rail for that purpose are seen at *p*.

616. *Dressers in the Gothic Style.* Fig. 563, p. 296, to a scale of three eighths of an inch to a foot, is considered in the Gothic style, from the character of its mouldings at *q q*, and of the upper part of its supporting columns, *r r*. It has an open potboard and two large drawers over it. The plates, &c., are intended to lean forward, as shown in this figure, and also in the section, fig 564. Fig. 565 is a dresser more decidedly in the Gothic style, as is obvious from its openings with pointed-arched tops in the ends which support the shelves, and from its pointed-topped panels in the two cupboard doors. There are three shallow drawers under the board or table, two shelves in the middle, and a lock-up cupboard on each side. The plates are intended to lean back, as shown in the section, fig. 566.

617. *Fixed Corner Cupboards.* Where the dresser is without cupboards, as in figs. 557 and 563, a corner cupboard becomes requisite for cups and saucers, glasses, the tea-caddy, liquors in daily use, &c.; and these cupboards are cheapest when put up as fixtures; because the shelves, instead of being fitted into wooden sides or linings, are then let into the plaster, or fixed on slips nailed to the wall. In small rooms these cupboards are very convenient, as they occupy very little space, and, for a moderate sum, supply a handsome article of furniture.

618. *Fixed Corner Cupboards in the Grecian Style.* Fig. 567, p. 299, to a scale of three eighths of an inch to a foot, is the external view of a corner cupboard in a plain Grecian style. The side styles are finished with pilasters, and there is a handsome cornice at top. There are an upper cupboard with two glazed sashes, and a lower one with two paneled doors. Fig. 568 represents another cupboard, in the Grecian style, with the doors open to show the interior, and standing on turned legs, to give it the character of a portable piece of furniture. The shelves, which are supposed to be of deal, are let into the plaster; and the whole, outside and inside, including the plaster between the shelves, is painted of a wainscot colour. Fig. 569 is a Grecian corner cupboard in a more elevated style of design; the panels below and the round heads of the sashes give it an elegant and rather uncommon air.

619. *Fixed Corner Cupboards in the Gothic Style.* Fig. 570 is an open corner cupboard without doors. The shelves are nailed to slips of wood; and these, with the wall between them, should be painted of the same colour as the side styles or pilasters, and the whole will look well, if grained to imitate wainscot. Fig. 571, p. 300, shows a plain Design, with glazed doors above, and paneled doors below. Fig. 572 is a Design somewhat more elaborate; the pilasters having sunk panels; and the sash-heads and cornice having more work in them. The expense of fixed corner cupboards of the kind here shown, with glazed doors above and paneled doors below, varies from £2 to £5. The cost will be considerably diminished by having the upper doors in single wooden panels, instead of being glazed.

Sect. IV. *Designs and Directions for Cottage Furniture and Furnishing.*

620. *The Furniture and Furnishing of Cottages* have been hitherto neglected in every country where the comfort of the cottager has depended on those above him, and this never can be fully remedied till the inmate of the cottage is sufficiently enlightened to be able to take care of himself. We have shown, in our Chapter on Model Cottages, p. 8, that all that is essential, in point of the general arrangement of a house, may be obtained in a cottage with mud walls, as well as in a palace built of marble; and we intend now to point out in what manner all that is comfortable, convenient, agreeable, and much of even what is elegant, in modern furniture and furnishing, may be formed of the indigenous woods and other common articles of every country, as well as of the most beautiful exotic timbers, and other costly materials obtained from abroad. If it should be asked, whether we expect that such Designs as those which follow can be executed or procured by the cottagers of this country, we answer that we trust they soon will be; and we believe that the first step towards this desirable end is, to teach them what to wish for. As the spread of knowledge becomes general, it will be accompanied by the spread of taste; and correct habits of thinking will go hand in hand with comfortable dwellings, and convenient, neat, and elegant forms of furniture. An approximation to equalisation in knowledge will lead to an approximation in every thing else; for knowledge is power, and the first use which every man makes of it is, to endeavour to better his own condition. Our grand object, therefore, in this as in every other department of our work, is, to cooperate with the causes at present in operation for bettering the condition, and elevating the character, of the great mass of society in all countries. Though most of the Designs submitted are of a superior description to what are common in cottages, they are not on that account more expensive than various cumbrous articles of furniture now possessed or desired by

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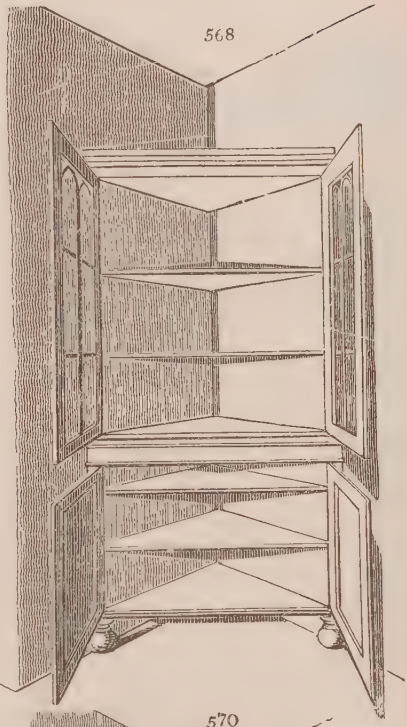

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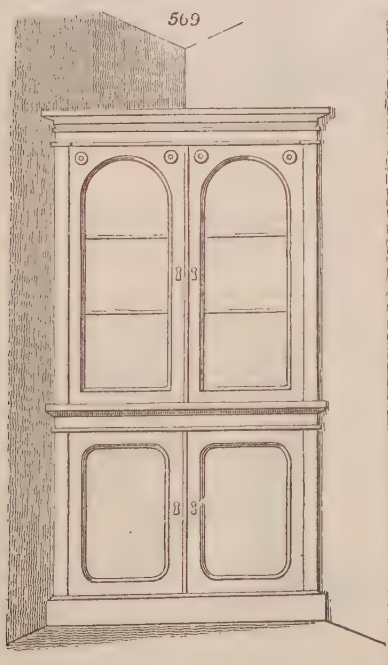

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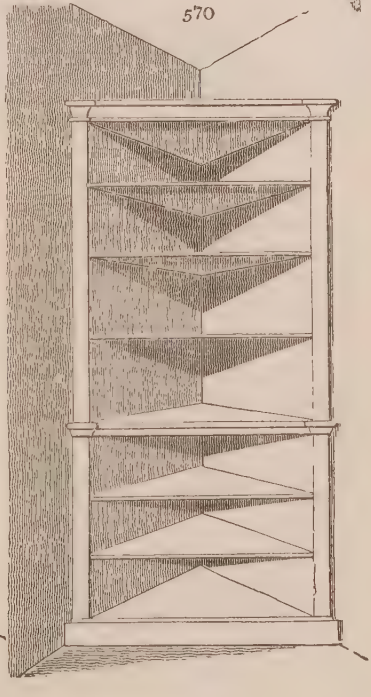

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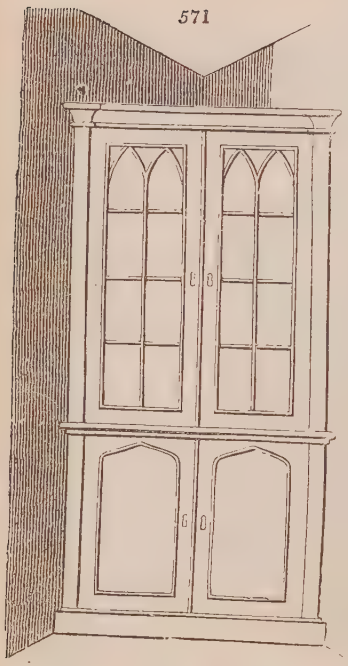

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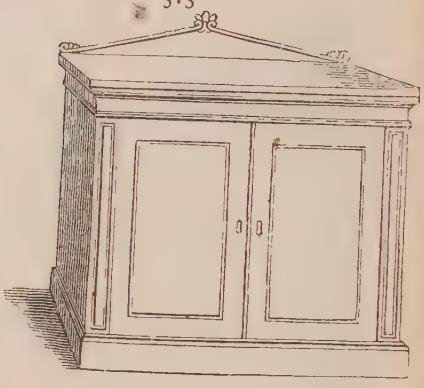

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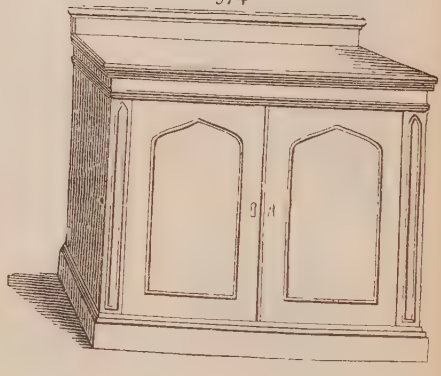

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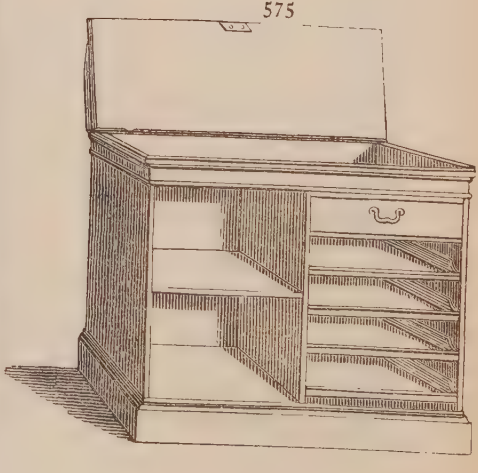
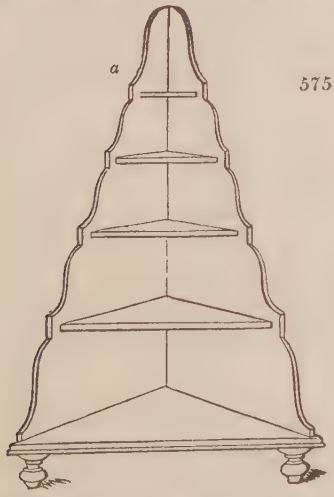


every cottager in tolerable circumstances. The difference will be found to consist chiefly in the kind of labour employed in making them, and in the style of design which they exhibit. To speak in familiar language, we have given more work for the joiner than for the carpenter; and our Designs pretend to nothing more than what could be invented by any joiner who could read and draw, and derive ideas from books. Mr. Dalziel, under whose direction most of them have been prepared, has shown superior taste in preserving the character of simplicity, and preferring what was really good in itself to what had only novel or showy appearance to recommend it. For the Designs for iron furniture we are chiefly indebted to Mr. Mallet, jun., of Dublin; but partly to Messrs. Cottam and Hallen, and Mr. Eckstein, of London. We shall present the following Designs in the order of sideboards, dumb waiters, bookcases, book-shelves, wardrobes, chests of drawers, tables, chairs, stools, benches, sofas, beds, cribs, window-curtains, inside blinds, looking-glasses, fenders, carpets, oilcloths, matting, umbrella stands and hat and cloak holders, mats, scrapers, clocks and musical instruments, pictures, sculptures, and other ornamental furnishing: the various utensils employed in cookery, brewing, baking, washing, the dairy, &c., or for the table and bed-rooms, including earthenware, China and glass of every description, with linen, the minor articles of ironmongery, cutlery, &c., do not come within our plan, because they cannot be considered as architectural in their Design.

621. *Sideboards for a cottage parlour* generally include cupboards, unless there should be a corner cupboard in the room, either as a fixture, or as a movable piece of furniture. Fig. 573, p. 300, shows a small cupboard side-board for a neatly furnished cottage parlour, in which there is not much room. In point of style it may be considered Grecian; because the panels do not indicate any thing of pointed architecture at their angles, and because the mouldings under the top belong to the former style. Fig. 574 is a Design in the Gothic style; and fig. 575 shows the interior of the Design. A partition is fixed in the centre, which divides the cupboard into two parts. One side has a drawer at the top, which drawer is partitioned, and lined with baize, for holding plate. There are four tray shelves below, which draw out, the space between them being of sufficient height to hold wine glasses, tumblers, &c. In the other side is one fixed shelf, leaving height enough for bottles and decanters both above and below. The lower part may be lined with lead, to keep wine and liquors cool; or it may contain earthenware wine coolers for that purpose, the bottom being lined with lead, and having a ledge in front about an inch high, to retain any water that may exude from the coolers. The top of this sideboard lifts up, and leaves a well for holding tablecloths, napkins, doyleys, table-mats, &c. This article may be made in deal and painted; of any native broad-leaved wood, as oak, elm, walnut, &c., or of mahogany. Made of the last material, in London, the price would be from £7 to £12, according to the style of finishing

622. *Corner Cupboards* are best put up as fixtures (see § 617), and Designs for them may be made after the style already given, figs. 562 to 574; all the difference in construction between a movable and a fixed corner cupboard, being, that the former have linings or sides of boards, to which the shelves and side styles are fixed. In some old



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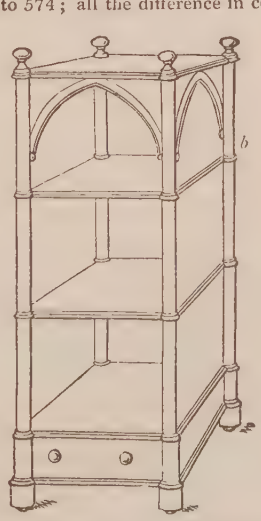

cottages and farm-houses there is a sort of pyramidal corner cupboard, fig. 575 *a*, to a scale of half an inch to a foot, sometimes in use for holding glasses, the punch bowl, &c.; and another sort of corner cupboard, fig. 575 *b*, to the same scale as the preceding Design, has this advantage, that, when not in use, its two open sides may be turned against the two walls of the room, and, its two close sides only being seen, it may pass with a stranger as a book or music stand, for which, indeed, a similar design is frequently used. There is a drawer below, for holding plate, and on the top may stand the tea-urn; or, in the event of its being used as a music-stand or book-stand, the drawer may contain manuscripts, and the top a globe or bust. This piece of furniture should stand on castors.

623. *Dumb Waiters*, or portable sideboards, are useful in small families, with few or no servants or children. The most common form is that of a candelabrum, with tiers of circular shelves fixed to an upright axis, the shelves diminishing from the bottom upwards, and the whole on castors. The two figures last described will also make very good dumb waiters.

624. *Bookcases and Escrutoires, Secretaries, or Bureaus*, are extremely useful for holding books, keeping papers, or writing on; and, therefore, no cottage parlour ought to be without one. Figs. 576 and 577 are bureaus in the Grecian style; the middle part of fig. 576 draws out, and the front lets down and forms a writing-desk. The lower part, enclosed by doors, may be either fitted up with shelves or drawers; the upper part is for books. Fig. 577 has a falling board or flap, which, when let down, as shown in fig. 578, forms a writing-desk. Figs. 578 and 579 are bureau bookcases in the Gothic style. In the first of these figures, the writing-table is formed by pulling out a drawer, and letting down its front, as in fig. 578; in the second (fig. 579), the sloping flap falls down, and rests on two sliding pieces, *a*, technically called lopers. This last description of secretaries is often made without the addition of the bookcase over it; and, instead of paneled doors, it is more common to have drawers exposed to view. The knobs to the drawer desks, figs. 576 and 578, are supposed to be made of wood, mahogany, ebony, or laburnum, as being more in harmony with the articles, and as less liable to tarnish than brass, the usual material of which similar handles are formed. The astragal moulding which covers the joint formed by the two doors of each Design is also commonly formed of brass; but wood, generally of the same sort as the rest of the fabric, is now substituted by the best manufacturers. Even the linings to keyholes, fig. 580, and the shields or escutcheons of locks, are now made of ebony, or some other hard wood, in all the better articles of cabinet furniture. Fig. 581 shows a section of the door style and astragal of the Grecian Designs; in which *b* is the astragal, and *c* the door style. Fig. 582 is a similar section, showing the Gothic astragal and door style. It will be observed that the astragal is not worked on the door style, but on a distinct piece of wood, *d*; which is afterwards glued, and rabbeted on to the edge of the side style. The situation in a room for pieces of furniture combining bookcases and secretaries should never be on the side opposite to the window; for nothing can be more awkward than the idea of a person sitting down to write with his back to the light, or, should the room be small, to an open fireplace. Recesses in those sides of a room, which form right angles with the window sides afford the most desirable positions; and, of these, the preference is always to be given to the side containing the fireplace. In rooms heated by stoves or flues, the same care as to the position of the secretary with reference to the fire is not requisite.

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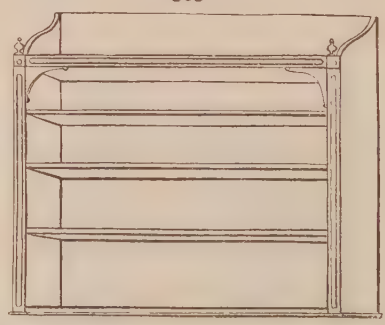

625. *Book-shelves* will shortly become as necessary as chairs or tables, for the cottage of even the humblest labourer. We shall give two Designs, figs. 583 and 584; the first may be considered as suitable for a Gothic cottage, and the other for a plain one. Either of these Designs may be fixed against a wall, with the lower shelves about six inches higher than what is called chair-back height from the floor. Or they may be set on a chest of drawers, or secretary, provided these are in suitable styles of Designs. The balusters which support the shelves, in fig. 584, are called by cabinet-makers shaped columns; and they may either be made plain; fluted or reeded, as at *g*; or with carved foliage, as at *h*, in the same figure.

626. *Wardrobes* are as essential in a bed-room, as a dresser is in a cottager's kitchen, or a cupboard, or sideboard of some sort, in his parlour. Figs. 585 and 586, p. 304, on a scale of three eighths of an inch to a foot, exhibit a Design for a wardrobe in the Grecian

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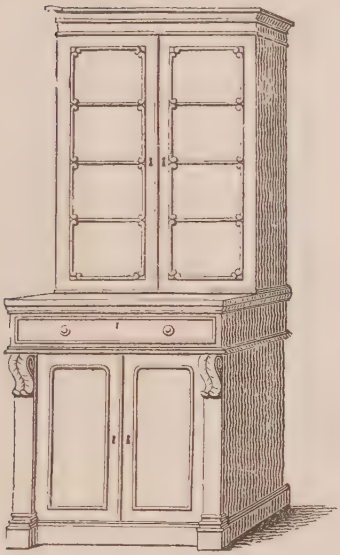

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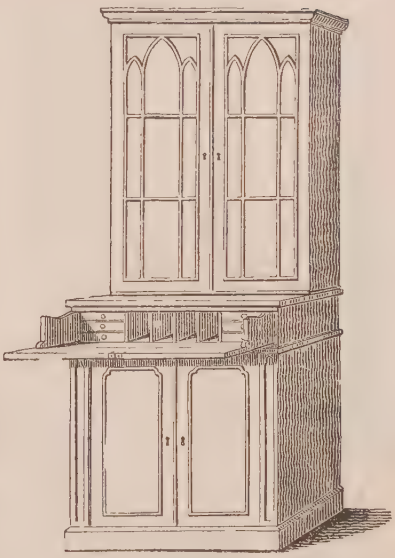

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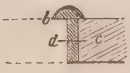

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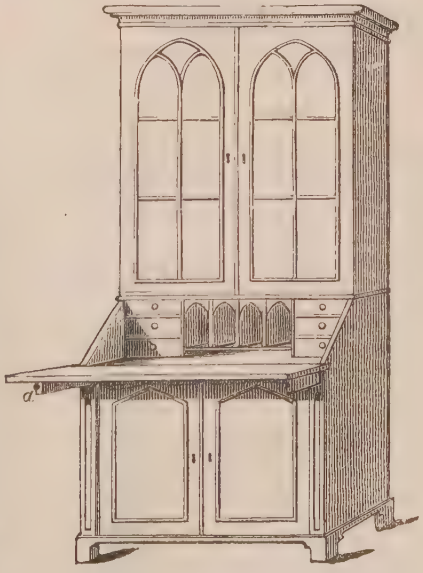

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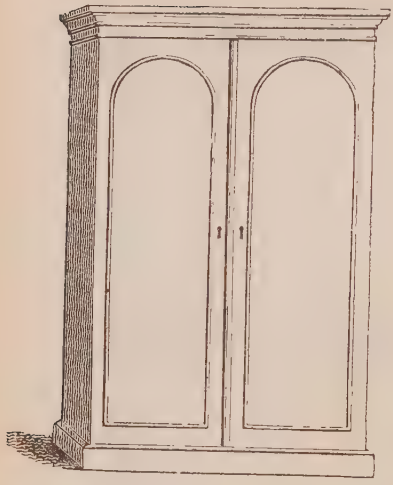

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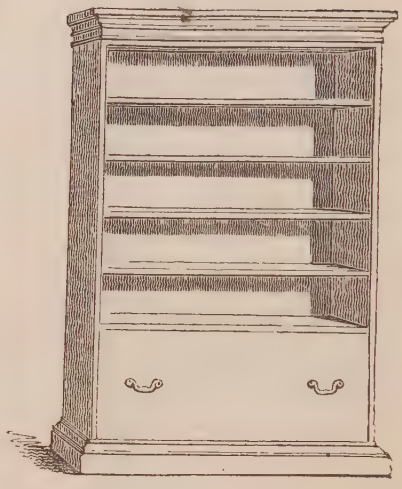

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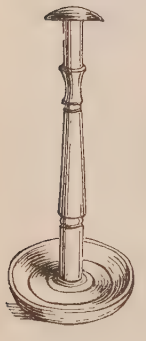

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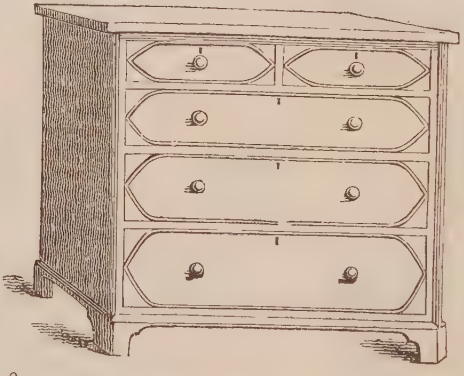

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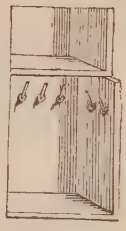

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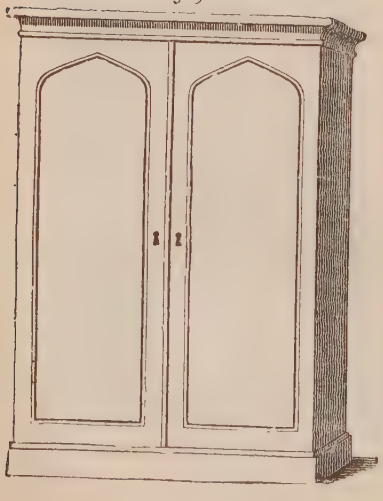

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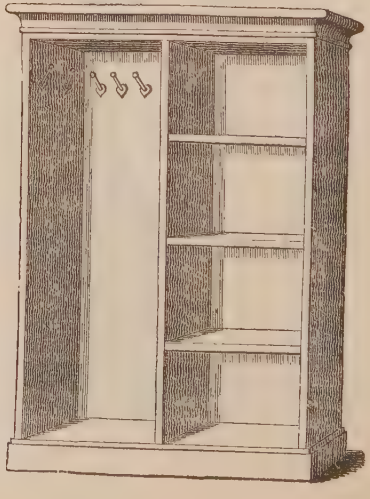
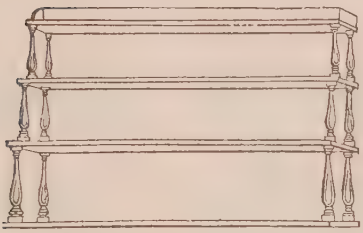
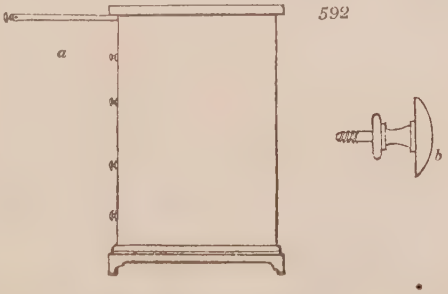




584

style. Fig. 586 is a view of fig. 585 with the doors removed, showing four inside sliding tray shelves, with a deep drawer underneath for bonnets, &c. In this drawer are commonly fixed bonnet-holders, fig. 587, and against its sides cap pins, fig. 588. Fig. 589 is a Design for a wardrobe in the Gothic style, and also differently arranged in the interior. Fig. 590 shows a view of it with the doors removed. There is an upright division in the centre, with four fixed shelves on one side, and on the other an open space, with cloak pins fixed round it for hanging gowns, coats, caps, &c., upon. It is to be remarked, that the row of pegs is continued round the inside of the door. In the bottom of this division may be a fixed or portable bonnet-holder, such as fig. 587. These wardrobes may be made of deal, and painted wainscot colour, or of any other suitable to the other furniture of the room. The price in London is from £3 to £5 each.

627. *Chests of Drawers* are the common substitute for wardrobes, but they are very far inferior to them for keeping clothes, and create a great deal of useless labour in pulling out and pushing in drawers, and perhaps in locking and unlocking them; whereas one lock secures the whole of the wardrobe; and, by the opening of one door, the whole of the contents are exposed to view, and the article wanted can be had with the least possible trouble. For those who prefer the old mode, we have given the Design 591, to a scale of half an inch to a foot, which represents a chest of drawers in the Gothic style. It may be constructed of common deal, painted wainscot colour, with real oak knobs. The cost in London is from £3 to £4. A common chest of drawers may be made more useful in a small room, by having a slider to pull out in front, from under the top above the first drawer, as in fig. 592, *a*; the two bottom drawers may, if required, be made into one deep drawer, to hold bonnets, &c., like the drawer in the wardrobe, fig. 586, p. 304. Knobs of the same wood as the furniture, fig. 592, *b*, are now generally substituted, as in most other pieces of furniture, for brass. They harmonise better, and do not tarnish; besides, the fashion is, at present, comparatively new in London, and this confers on them a certain degree of factitious elegance, viz, that of novelty and fashion.



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628. *Tables* are of numerous kinds and various forms. We shall take them in the order of kitchen tables, parlour tables, and bed-room tables.

629. *Kitchen Tables* ought to be strong, on account of their continual use; and, if possible, they should be contrived to fold up, or otherwise go into little space, when not in immediate use, in order to afford more room for carrying on the business of the kitchen. One of the most economical of kitchen tables is that formed by the kneading-trough, represented by fig. 593, to a scale of half an inch to a foot, of which *a* is an end view. Such tables are a good deal in use in the cottages and small farm-houses in many parts of England. The cover, which, when on the trough, serves as a table or ironing-board, either lifts off, or, being hinged, is placed so as when opened it may lean against a wall, when the trough is wanted to be used. Frequently a division is made in the centre of the trough, so that the dry flour can be kept in one compartment, and the dough made in the other. Sometimes there are three compartments, in order to keep separate two different kinds of flour or meal. The board forming the cover ought to be an inch and a half thick, and always in one piece, in order that neither dirt nor dust may drop through

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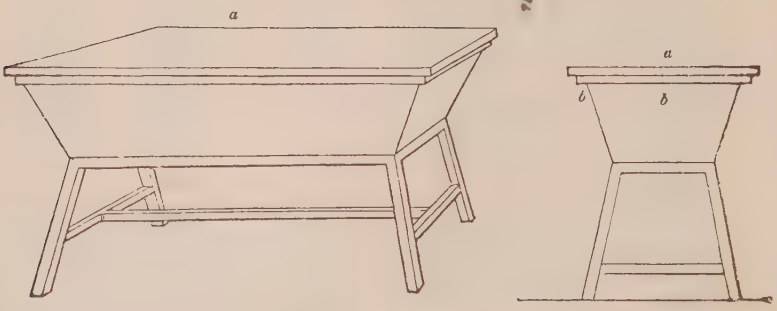

the joints. There ought to be four fillets, *b b*, nailed along the under side of each edge of the cover, so as to keep it exactly in its place when on. Deal, beech, sycamore, and ash are good woods for the trough and cover of this table, because they are light in colour, and have a clean appearance. No part of them should be painted, because both the trough and cover, when used for making bread, will require frequent scouring to keep them clean; and, if the board should be used for an ironing-board, the heat of the irons would blister the paint, and make it stick to the cloth or blanket used to cover it. Fig. 594, p. 313, to a scale of half an inch to a foot, is a kitchen table on four fixed legs, which, by means of two portable legs in addition, can be extended at each end, so as to make a table of double its original length. Thus, suppose the table, fig. 594, when folded up, to be three feet long, and two feet six inches wide, it may, in two minutes, by screwing in the two portable legs, be made six feet long; and, instead of being only large enough for two persons, it may dine several, or be used as an ironing-board, which, in narrow rooms, must obviously be a great convenience. There is a drawer under the centre of this table, in which the portable legs may be kept; or they may be set elsewhere, and the drawer used for other purposes. This Design might be varied by having lopers to support the end leaves, instead of portable legs; or the leaves might hang down, like those of a common dining-table, and be supported by draw-out feet. In the construction, care must be taken to have the wood of the hinged leaves very dry and well-seasoned, otherwise they will warp; and the ends of these leaves should be clamped at each end, by a piece of wood the reverse way to the grain of the leaf or flap. The term clamping is applied by cabinet-makers, when a piece of wood is grooved, and another tongued into it, as in fig. 595. This table will cost in London from £3 to £4. Fig. 596, to a scale of half an inch to a foot is a fold-up kitchen table, chiefly valuable because it will take up little room when not in use, as in fig. 597

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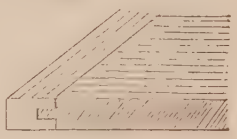

The top consists of two leaves hinged together at the ends; and, when the table is opened, it is prevented from falling down in the middle by the wooden button, *c*, being locked into the notched piece, *d*, figs. 598 and 599. The former figure represents the under side of the table. The tops and feet of the standards, *e e*, and the rails, *f f*, must be beveled, to admit of their free action. The legs may be fastened together, when shut, by a hook and eye at each end, as shown at *g*, otherwise it would be apt to warp. This table will be found very convenient for carrying out to a cottage lawn or arbour, or for using under a veranda. Where, however, the veranda is narrow,

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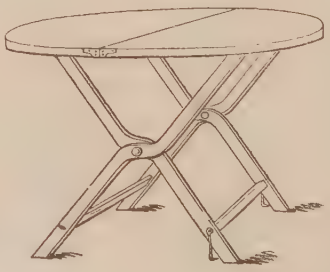

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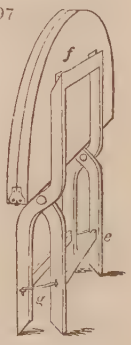

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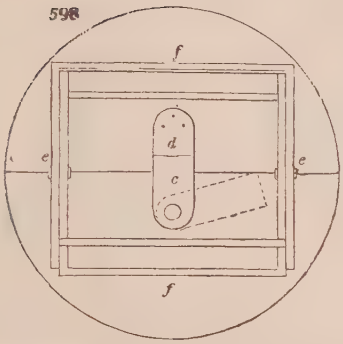

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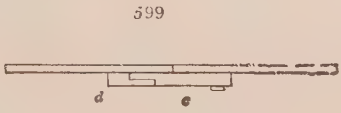

the preceding Design, forming a long narrow table, will, perhaps, be found more commodious. Fig. 601 shows a table with a semicircular top, double-hinged at the ends, and supported by three legs and a triangular frame, as shown in fig. 600. The two

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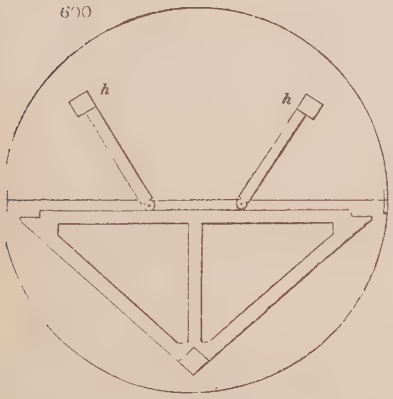

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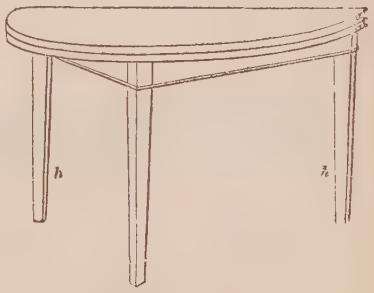

legs, *h h*, fold out, to support one half of the top, when it is opened and turned over on them. As this table, when shut up, will stand against a wall, it will take up but little room, and is, therefore, very suitable to a cottage kitchen. A common kitchen dining-table, square, round, or oval, with a fixed centre, and two hinged folding-down leaves, supported, when up, by hinged folding feet, is so familiar a form, that we have not thought it necessary to give a Design for it. Its construction will be easily understood from that of the fixed flap table with folding legs, § 613, fig. 550.

630. *Parlour Tables.* Where the parlour is square, a round table will be found the handsomest and most appropriate. Fig. 602, designed by Mr. Mallet, shows a round table with a wooden top, supported on a cast-iron pillar, with iron castors. Each of these castors consists of a ball one inch in diameter, having free motion in every direction within a wrought-iron cup, which is pressed into its form in a fly press, from a piece of flat iron; and, the ball being put into it, it is then closed sufficiently at the mouth, to prevent the ball from falling out. The construction of this kind of castor (which Mr. Mallet informs us he invented some time ago, and which has been since used extensively) will be better understood by fig. 603, in which *a* is the ball of a single castor; *b b* are the sides of the wrought-iron cup; and *c* is the leg of the table, bed, sofa, or other piece of furniture, to which the

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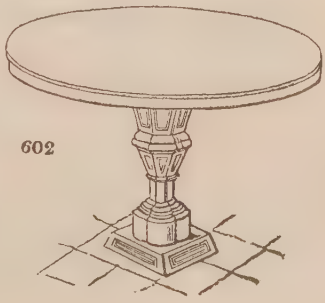
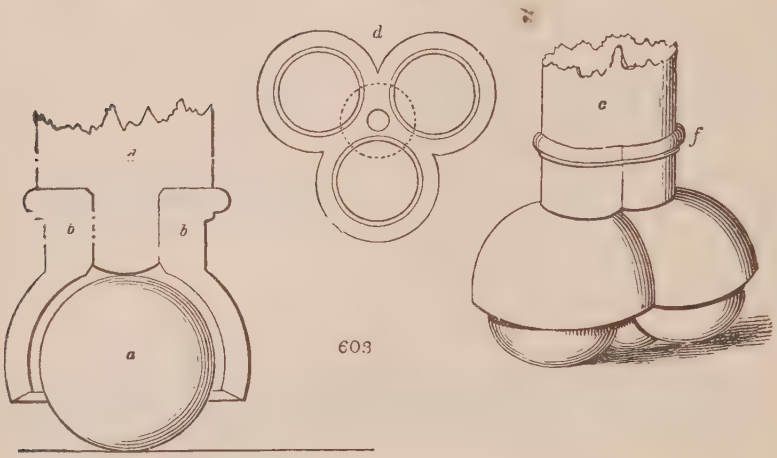
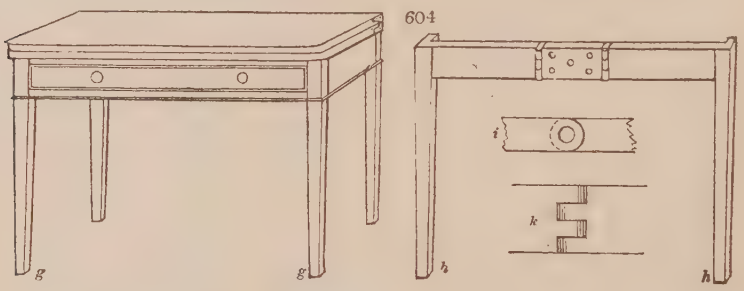
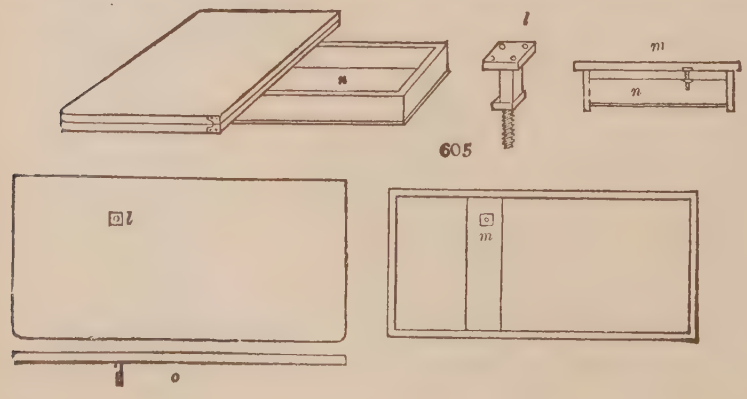




cup is riveted: *d* shows the plan of three castors, such as are used for the table, fig. 602; and *e* is a view of these castors appended to the round foot of any piece of furniture, the junction being concealed by the moulding *f*. Mr. Mallet states that three castors placed in this manner form an exceedingly firm and effective locomotive support for any heavy article of furniture. The pillar of this table is cast hollow and thin, so as to come far cheaper than the same Design could be made in the



commonest description of wood. Fig. 604, to a scale of half an inch to a foot, is a table on four legs, and which, when covered with green baize, is commonly called a



card table. The top is made double, and hinged at the back, so as to fold over, and there is a drawer in the frame. The two legs *g g* are fixed, but the other two, *h h*, are hinged, and fold out to support the folding flap. The joints, which are made in the rails of the folding legs, are of wood, as shown at *i* and *k*; and, being put together, a piece of strong iron wire is driven down the centre of the rounded ends, and forms the axis on which they turn. This joint is technically called a knuckle joint; and rails of tables hinged in this manner are called fly rails. Fig. 605 is a table, which, when folded up like fig. 604, has exactly the same appearance. The top is double, like the top of a card table, and turns round on a pivot *l*, having a fixed well, *n*, to answer the purpose of a drawer; when the flap is opened it makes a square table with rounded corners like the other. There is a rail, *m*, fixed to the upper side of the frame, to receive the pivot on which the top of the table works, as shown in the cross section, *n*, and longitudinal section, *o*. Fig. 606, to a scale of half an inch to a foot, is a table on four legs, with two drawers in

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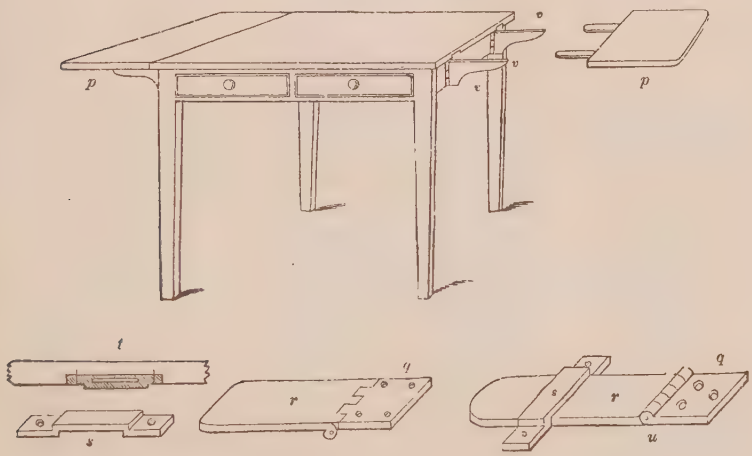
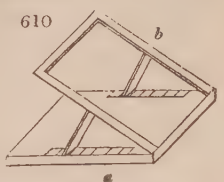
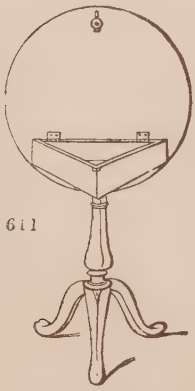
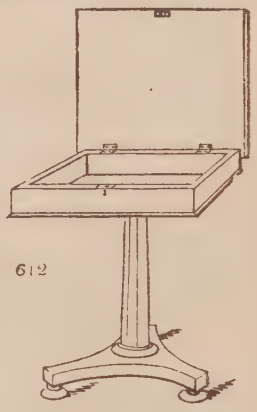


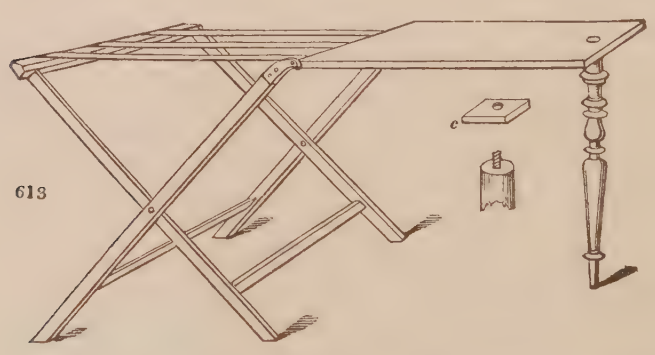
the frame. The end flaps, *p p*, are made to put on or to take off as required, by means of what are called strap hinges, which are fastened to the flaps. These hinges are shown in fig. 606, in which *q* is the part screwed to the under side of the flap; and *r* the strap or part which is inserted under the top of the table, into an iron plate, *s*, screwed to the under side of the top, as shown at *t*. The hinge of the strap is of the knuckle-joint kind, as exhibited at *u*. After the flap is put in, it is supported by small fly-brackets, fig. 606, *v v*. This is certainly a very convenient table, and very simple in its construction: it might be made still more economically, by substituting fixed bracket-shaped iron straps to the flaps, in lieu of the strap hinges; which would render both the latter and the brackets, *v*, unnecessary. The only inconvenience of this plan would be, that the flaps, when not in use, would require to be taken out and put aside. Fig. 607, p. 313, is a table on four turned legs with castors, and with the ends of the frame made to draw out to support two flaps, which may be loose, and fastened at the joints by sockets, *w*, and pins, *x*; or the flaps may be hinged to the ends of the top, and lift up and let down, being supported, when raised, by the end frames. A shelf might be added to this table, about fifteen inches from the floor, which would be found useful for holding workboxes, books, &c. Fig. 608, p. 313, to a scale of half an inch to a foot, is a plain parlour work-table, with two drawers; and with flaps having ruled joints to fall down, and fly brackets to support them when up. Fig. 609, p. 313, to a scale of three fourths of an inch to a foot, is a work and writing table for a cottager's wife; for we trust that the time will soon come, when not only every cottager's wife will be able to write as well as read, but will have leisure to do so. This table may be made much plainer than is here shown, and consequently cheaper. For example, if the legs were not turned, and the whole were made of common deal, it would cost little more than an ordinary table with two drawers. The bag frame, which, when economy was the object, might be made of glazed coloured calico instead of silk, is made to draw out in front, and the writing-drawer over it pulls out at the end. In this drawer there is a flap to write on, hinged to a sliding piece,

which may be pushed back from the front of the drawer, so as to raise the desk upon the edge of the table to the angle required. Underneath this writing-board is a space for papers; and, to the right, another for the inkstand, pens, and wafers. The writing-board, or flap, might be made to rise with a rack and horse, (fig. 610, in which *a* is the rack, and *b* the horse); but the first plan is far simpler, and answers the same end. Indeed, even the sliding piece might be dispensed with, and the writing-flap adjusted to the proper angle by pulling out or pushing in the drawer. At the opposite end of this table a flap is shown, which may be put up or let down accordingly as it may be desired to make the table longer or shorter. This is evidently a very convenient table; because a cottager's wife may have a book to read in lying at one end, writing materials at the other, and her work in the middle. Fig. 611 is a small tea or work table. The top is hinged on a triangular box, which may be useful to hold work in. When not in use, the top is set up on edge, and when brought down, it fastens itself by a common catch fastening. Fig. 612 is a neat work-table, which may be made by any joiner, out of the common woods of the country, at a very trifling expense, and placed on three of Mallet's iron castors, or even on turned knobs in imitation of castors; either of which, by raising it from the ground, would add much to the lightness and elegance of its appearance. Figs. 613, 614, 615 represent a very useful article, called a camp table, from its going into little bulk, being light, and being used by officers in camps. Fig. 613 shows it opened out to its full extent; the top being hinged to the two legs, and supported by a portable leg which is fastened into it by a screw and socket, *c*, in fig. 613, and can be removed at pleasure. When not in use, this leg is fixed to one of the legs of the stand by two pieces of girth webbing, *d d* in fig. 615, which are fastened to the leg of the stand. When the stand is opened to its full extent, it stretches out, as a top, three pieces of webbing, which serve as a tray-stand; and a tray is generally made of a proper size to go along with the table. Fig. 615 shows how this camp table may be used as a common table; the hinges projecting above the rail of the stand in such a manner as to let the top turn round either way. Fig. 614 shows this table shut up; there are two turn buckles, *e*, on the legs at *f*, to keep the top fastened, and to prevent it from swinging about when the table is moved. In families, accustomed to give large dinner parties, these tables are found useful, as forming additions to the sideboard: they are also brought in requisition when parties are given in the open air, or when a meal is taken in any room deficient in tables.









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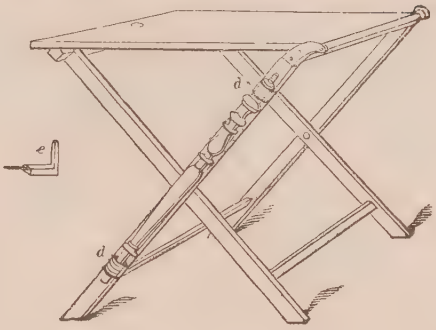

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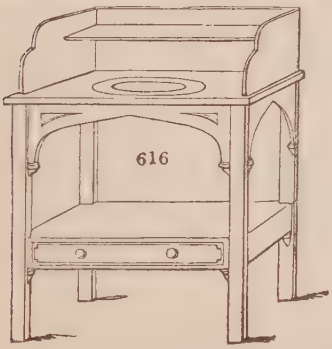
631. *Bed-room Tables* are of three kinds: those for holding washing utensils; dressing-tables; and tables for sick persons. Fig. 616 is a small wash-hand stand, or table, in



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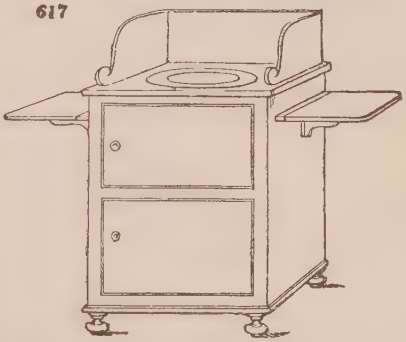

the Gothic style, with a shelf below, and a drawer under it. The hole in the top is cut round to receive the basin, and on the back-board is fixed a small shelf to hold a glass, trays for brushes, &c. This table may be made of oak, or of deal painted and grained in imitation of that wood. Fig. 617 is a small enclosed wash-hand stand with two cupboards; one of which will hold the ewer, and the other a night-vase. There are two hinged shelves, one on each side, supported by fly brackets, in order that they may be let down to save room, when not in use. Fig. 618 is a Design for a lady's wash-hand stand, which has been sent us by its inventress. When not in use, the basin is concealed by two box covers, which are hinged; and which open and turn over when the stand is used, affording space for soap-holders, brush-trays, &c. There is a drawer below, with partitions for keeping these and various other articles belonging to the toilette; one partition having a flat board raised two inches from the bottom of the

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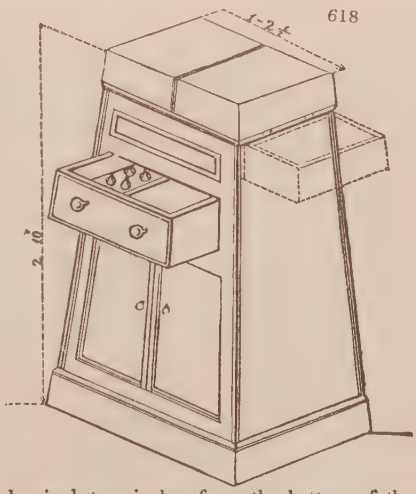
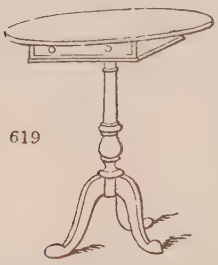


drawer, and being pierced with holes for scent bottles, &c. Below this drawer there is a deep cupboard with double doors. This wash-hand stand, which has a neat and rather massive or architectural appearance, is said to be a great favourite with all the ladies who have seen it. Fig. 619, to a scale of half an inch to a foot, is a small dressing-table, with a drawer in front to hold combs, brushes, &c. Common dressing-tables, consisting of a top without flaps, supported by four legs, and with one or two drawers, are so simple in their construction as not to require any particular exemplification. Fig. 620,



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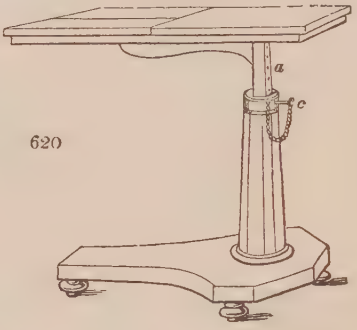

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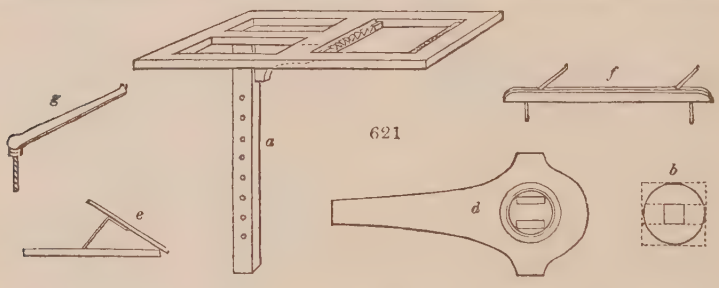
to a scale of half an inch to a foot, is a table for invalids, commonly called a bed table; which is a very great convenience to a person bedridden. The top of this table is made to rise and fall at pleasure, by raising or lowering the upper part of the pillar, *a*, which is perforated with holes at given distances, and which works in a square groove, in the centre of the lower part. This lower part is formed of four pieces glued together, as shown in the plan, *b*, in fig. 621. It is firmly fixed in the bottom block by a mortise



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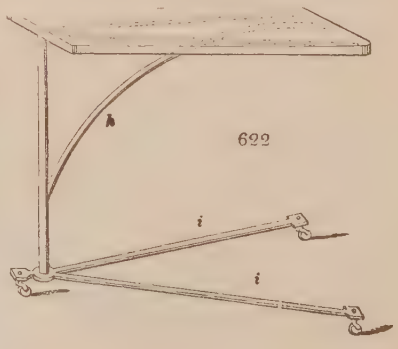
and tenon, and at top the four pieces are confined by an iron ferule, to keep the joints from opening: the mortise at bottom sufficiently confines the lower part of the pillar. The height of the top is regulated by moving the pin at *c*; the block or foot, of which *d* represents a plan, is elongated on one side to about the same extent as the top is elongated on that side; and, when the table is in use, the block is turned under the bed, and the top over it; the latter being adjusted to the height most convenient for the patient. This table is very frequently used for reading in bed; and in that case it is generally made with a horse and rack, *e*, and a shifting ledge, *f*, to support a book, at one end. This ledge is fixed by two wire pins, fastened in its under side, which drop into two holes bored in the lower side of the flap of the table. On the edge of this ledge are affixed two book-holders, *g*, commonly made of brass, but which are much better if made of ivory, or of ebony, box, or any other hard wood. This table, in mahogany, costs in London



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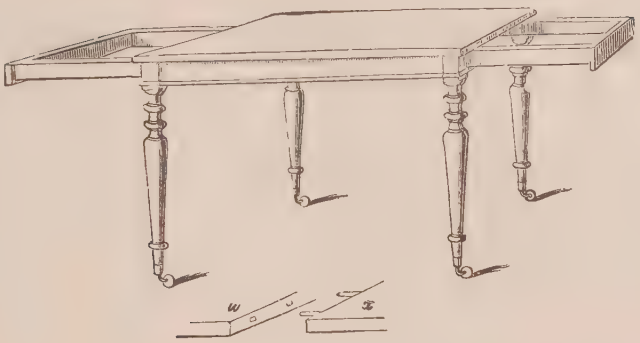

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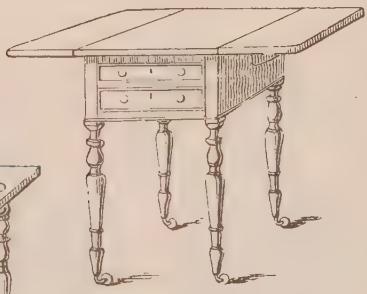

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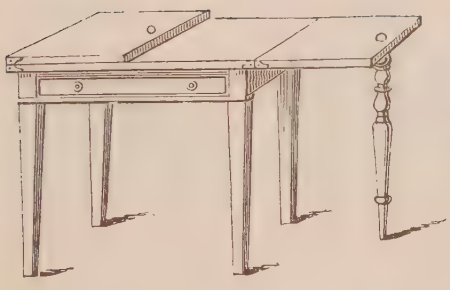

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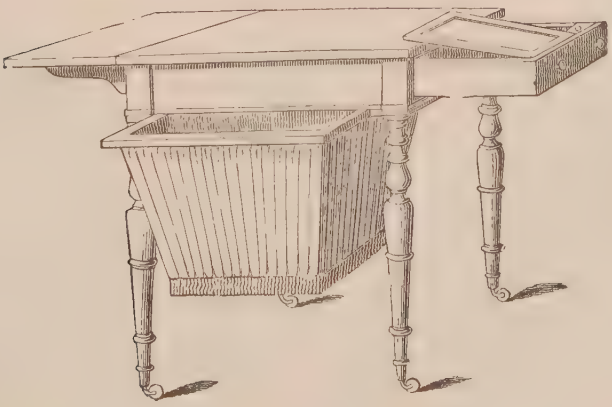

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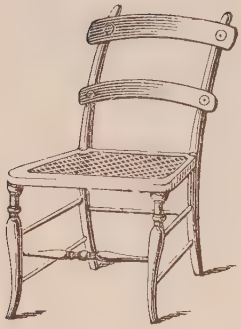

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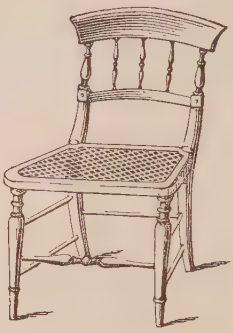

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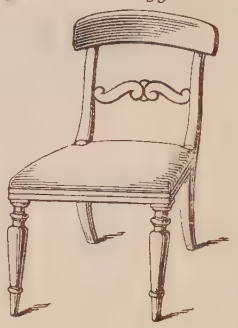

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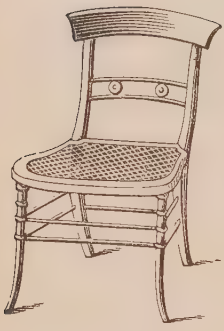

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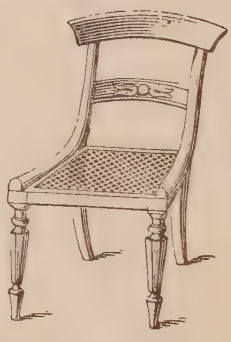

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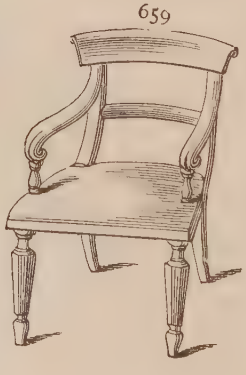

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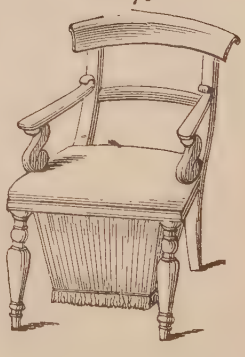
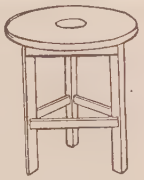


from £5 to £7; but, made of any common wood by a joiner in the country, it would not come to half the amount. Fig. 622 is a cheap invalid's bed table, which we had made at Bayswater some years ago, for our own use. It is simply a piece of mahogany board, about three feet long, and one foot nine inches wide, supported by a wrought-iron pillar, with a brace, *h*, and two feet, *i i*; the latter extending nearly the length of the top from the pillar, and spreading out at their extremities to about its width; thus producing in effect a table with three feet. It is placed on castors, and is light and strong. The height of the pillar must be regulated by the height of the bed. The mahogany board cost *5s.*, and the iron work and castors £1.



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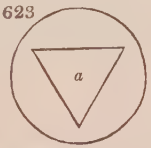
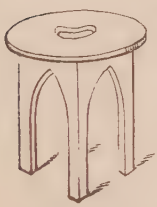


632. *Seats* may be arranged as stools, forms, benches, chairs, and sofas.

633. *Stools.* Common kitchen stools for children admit of little variety of design, without incurring more expense than would be justifiable by the use and place of the object. Fg. 623 shows the construction of a plain round stool, with three legs framed together at the top, and with rails about six inches from the ground; *a* shows the proportion which the triangular frame bears to the circular top. Fig. 624 is a round stool, which may be called in the Gothic style, and would be suitable in a Gothic cottage, where every thing was in character with that style. Fig. 625 is a



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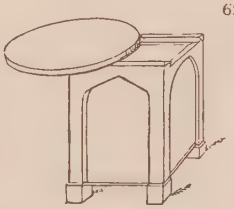

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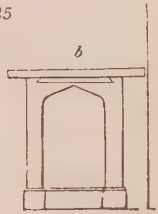

box stool; the lid slides in a groove, as shown by the section, *b*; but there is a stop, to prevent it from being taken off entirely. The box may be useful for a child to put its playthings in, and to teach it betimes those habits of order and neatness which are so highly essential to its success in life. Figs. 626, 627, and 628 are stools with cast-iron

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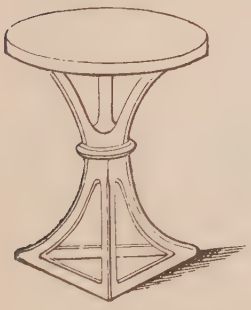

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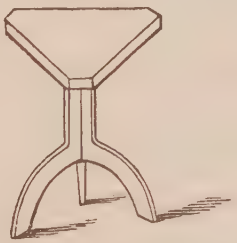

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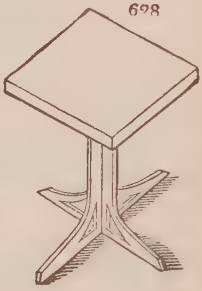

legs or pillars, invented by Mr. Mallet. The tops may be of any common wood, with or without cushions, according to the use for which they may be intended. Fig. 629 is a long stool, in the Gothic style, for a child; and fig. 630, one, also for a child, suitable for a plain cottage.

634. *A Footstool*, either plain or covered with carpeting, is an article of essential utility in every cottage where there is a mother; and it also forms a seat for a child. In England, they are very

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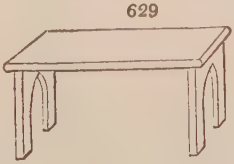

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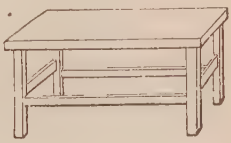
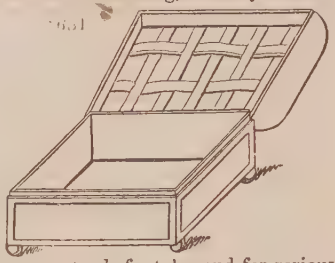


commonly formed by covering a bundle of bulrushes with rush matting, and they are then called hassocks. Fig. 631 is a design for a box footstool, which has been sent us by a lady. The top is formed of an outside frame, on which is stretched strong webbing, for the purpose of supporting the stuffing above, which is covered with carpeting of the same kind as that of the floor of the room in which it is to be used. The sides are of wood, painted of the same colour as the other furniture.



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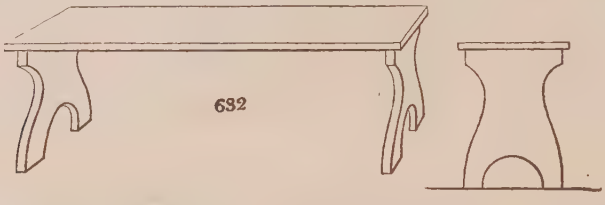
635. *Forms* may be described as long stools, for the use of several persons; and, as such, are useful in cottage kitchens, and in lobbies and passages. In the scullery they also often serve as stands for tubs, and for various



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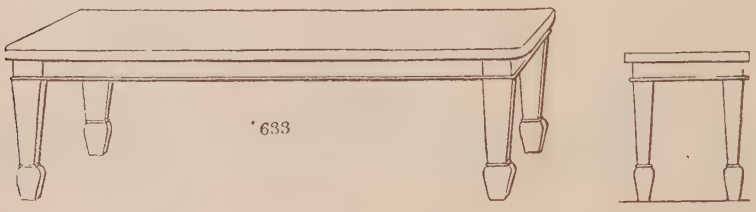
articles to be washed or cleaned, to prevent stooping more than is necessary. Two or more of them are, therefore, always requisite about a house. Figs. 632 and 633 are



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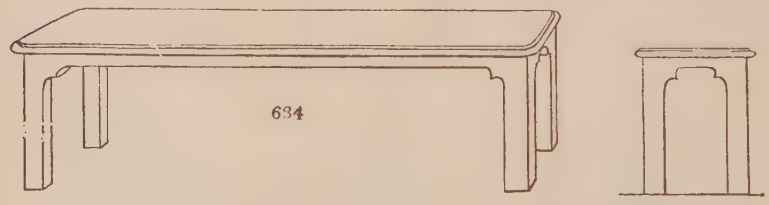
Designs for forms in the Grecian style, the construction of which will be understood by



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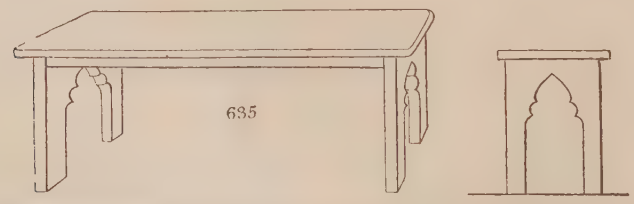
every carpenter. Figs. 634 and 635 are forms in the Gothic style, equally simple with the others. All these Designs are to a scale of half an inch to a foot.



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636. *Benches* are broad forms with backs to them, and sometimes with arms. Fig. 636 is a kind of bench with solid back and arms, for a cottage kitchen, commonly

called a settle, and frequently to be met with in public houses. The back forms an excellent screen or protection from the current of air which is continually passing from the door to the chimney. The drawers below are deep, and will be found very useful for a variety of purposes. On the back there might be a towel roller; or, in a superior kind of cottage, the back of the settle might be ornamented with prints or maps, in the manner of a screen. Placed in the open floor, where it would seldom require to be moved, there might even be book shelves fixed to this back, and a flap might be hung to it, with a jib bracket, to serve as a reading or writing table, or for other purposes. Fig. 637 is a handsome Grecian bench with turned legs and open back, but without arms at the ends, or drawers under the seat. Fig. 638 is a Gothic bench also without arms or drawers, but with a paneled back and square legs.

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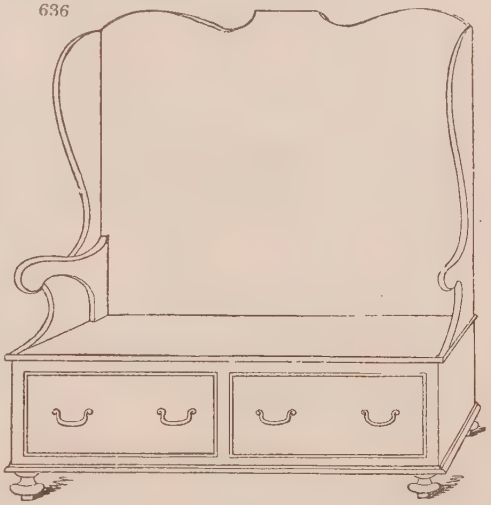

Fig. 639 is a Design for a handsomer Gothic bench

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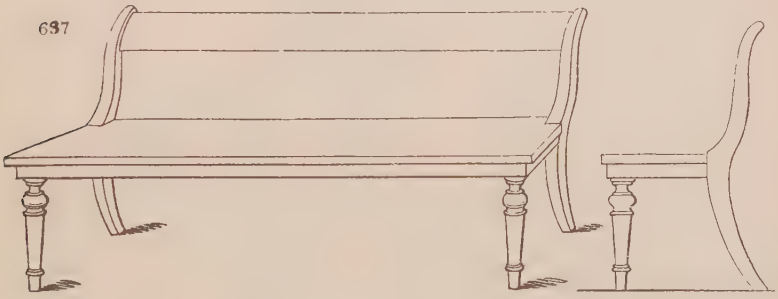

the back of which may either be paneled or open, according to the position, in the kitchen, where it is intended to stand. It has arms and two drawers, and has below the latter a broad shelf about three inches from the ground, on which shoes, &c., may

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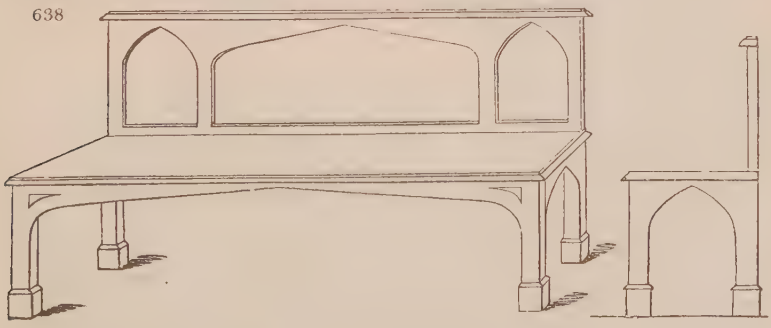
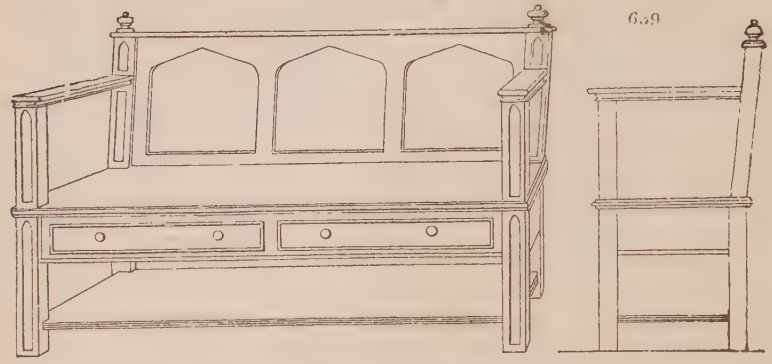


stand, or a dog may have a mat for sleeping upon. All these benches are to the same scale of half an inch to a foot.



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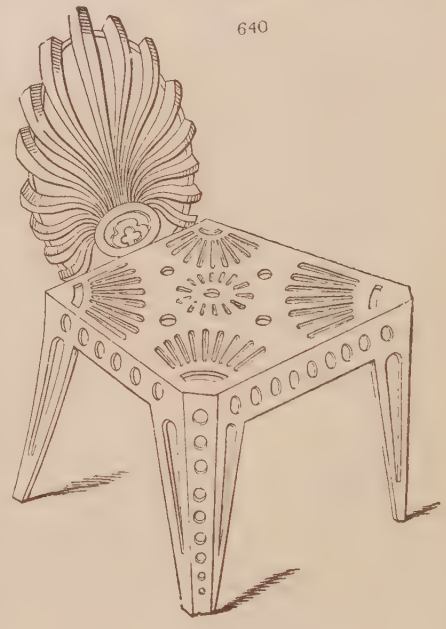
637. *Chairs* may be classed as suitable for the lobby, kitchen, parlour, and bed-room.

638. *Lobby Chairs*, being seldom moved, may be made of heavy massive forms in timber, or of cast iron, so as to have a decidedly architectural character. Fig. 640 is a lobby chair of cast iron, suitable for a porch. The Design is Etruscan; and Mr. Mallet, to whom we are indebted for it, says that it may be cast in two pieces. It would, therefore, come cheap, and would look exceedingly well in the porch of a cottage in the Italian style. Mr Mallet observes, that "where carved work, or much ornament, is to be executed in furniture, cast iron will always be found cheaper than wood, even though a small number only of the article were wanting." We hope that this hint will not be lost on Architects, who might thus introduce a style of highly improved design in all the principal articles of furniture, at a moderate cost. Chairs of this description, whether made of iron or wood, may be painted in imitation of oak in the following manner: — Give two coats of white lead in the usual mode; add a third coat of a pale yellow, as near as possible to the lightest part of the oak board to be imitated. Yellow ochre is rather too deep for most varieties of oak board; but stone ochre and white may be mixed together, till the exact shade be produced. When this coat is dry, the graining colour is to be laid on. This colour is not fluid like common oil paints, but is a mixture about the consistence of thick treacle, composed of various ingredients, and technically called meglip. The recipes given for making meglip are various; but the following are the articles principally used: sugar of lead, rotten stone, linseed oil, white wax, and spirits of turpentine. These are all ground up together, and immediately after the colour they produce is laid on, the graining is made by passing horn combs over it before it is dry. These combs have their teeth of different widths and lengths, and may be had of every combmaker. Fig. 642 is a lobby chair of wood in the Grecian style, which may be made of deal, with the exception of the legs, which, being turned, should be of beech or some fine-grained wood suitable for that operation. This chair may be painted of the colour of the wall against which it is to stand. Fig. 641 is a lobby chair in the Gothic style, which may be made entirely of deal, or of any other common wood, and painted and grained in imitation of oak.



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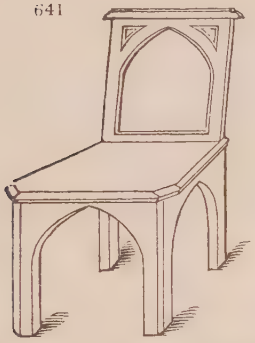

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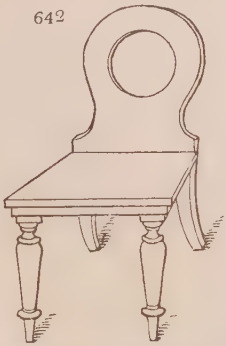

639. *Kitchen Chairs.* Fig. 643 is a Windsor chair, one of the best kitchen chairs in general use in the midland counties of England. The seat, fig. 644, *a*, is of elm,

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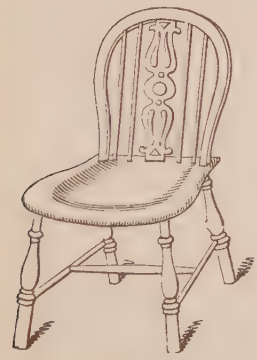

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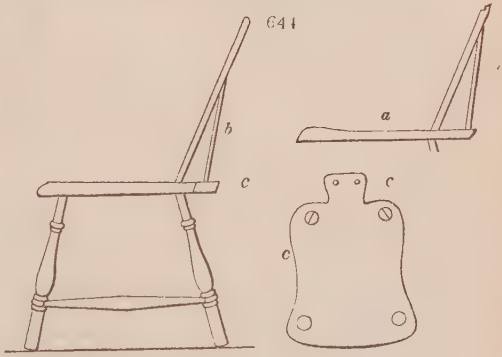

somewhat hollowed out; the outer rail of the back is of ash, in one piece, bent to the sort of horseshoe form shown in the figure, by being previously heated or steamed; its ends are then inserted in two holes bored through the seat, and are wedged firmly in from the under side. An additional support is given to the back, by two round rails, fig. 644, *b*, which are also made fast in two holes, formed in a projecting part of the seat, *c*. These chairs are sometimes painted, but more frequently stained with diluted sulphuric acid and logwood; or by repeatedly washing them over with alum water, which has some tartar in it: they should afterwards be washed over several times with an extract of Brasil wood. The colour given will be a sort of red, not unlike that of mahogany; and, by afterwards oiling the chair and rubbing it well, and for a long time, with woollen cloths, the veins and shading of the elm will be rendered con-

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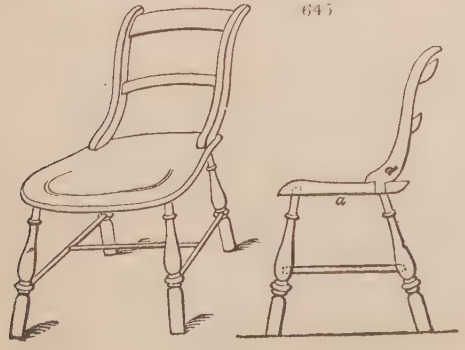

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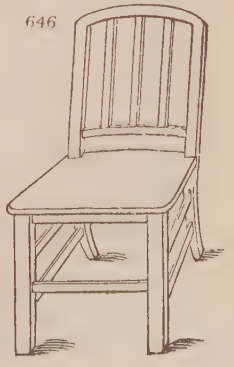
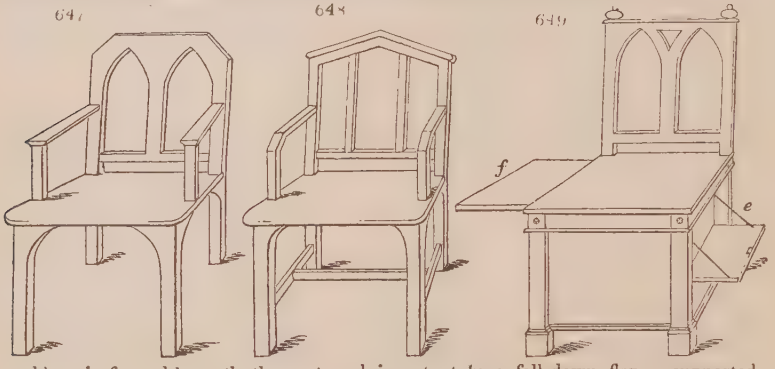
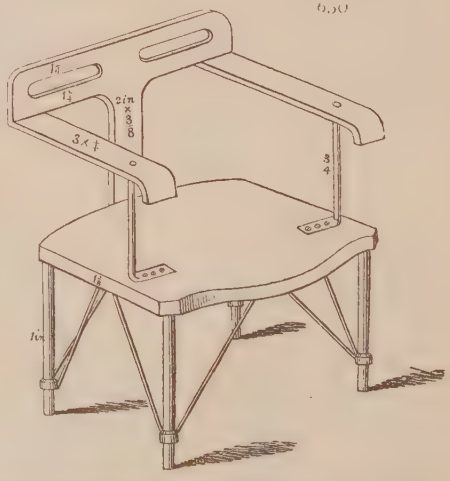


spicuous. Quicklime slacked in urine, and laid on the wood while hot, will also stain it of a red colour; and this is said to be the general practice with the Windsor chair manufacturers in the neighbourhood of London. Fig. 645 is a chair with a seat like the Windsor pattern, but with a different back, the two side styles of which are mortised into the seat, as shown at *d*. The legs are put together by dowels (wedges put in tenons after they are inserted in the mortise, to prevent them from being drawn back), like the Windsor chairs before mentioned, fig. 643. This forms a very comfortable and cheap chair. Fig. 646 is a very strong chair, being put together with mortise and tenon: it forms the common kitchen chair about London. It is generally made of deal, but sometimes of birch or beech, and is usually painted. Figs. 647 and 648 are two Gothic arm-chairs for kitchens; and fig. 649 is a kitchen workbox and table chair. The



workbox is formed beneath the seat, and is got at by a fall-down flap, *e*, supported by small chains or strong tape. The table, *f*, is simply a board which draws out from under the seat three fourths of its length, the remaining fourth remaining in to steady it; by which means lopers or fly-brackets are rendered unnecessary. Such a chair will be found very useful, and it may be made of deal, at a very trifling expense, by a common carpenter. The bottom of the box below may be loose, so that by turning the chair upside down, it may be taken out, and the box cleaned. Fig. 650 is a Design for an iron elbow kitchen chair, by Mr. Mallet. The back and elbows are cast in one piece; the supports for the elbows and also the legs are of gas tubing, screwed into a cross frame of iron, which proceeds from the back of the chair under the wooden seat. This is a strong, durable, and cheap chair, and only wants good cushions, for the back, elbows, and seat, to render it a most comfortable article for a cottager. Fig. 651 is a Design by Mr. Mallet for a cast and wrought iron chair, with a wooden seat. It is cast in one piece, the legs being tubular, with wire stays; the whole forming an exceedingly light and yet stable chair, weighing less than most oak ones. This chair might have a cushion seat, and also a cushion for the back, which the cottager might make himself of bulrushes, or of any other monocotyledonous water plant (the pith of these being filled with air, and therefore bulky, soft, and elastic), or of the chaff of Indian corn; covering them with cloth, and tying them on the chair with tape.



640. *Parlour Chairs.* These are of various patterns; and, as the characteristic of the kitchen chair was strength and durability, so that of the parlour chair is lightness and elegance. Figs. 652 to 657, p. 314, are plain Grecian chairs, sold in London at from 7*s*. to 12*s*. each They are usually made of beech, and may be stained to imitate mahogany, by the following process: — Wash the wood, after the chair is completed,

with red ochre mixed with thin glue and water, quite hot; when dry, rub the chair well with woollen cloths, till it assumes a good colour, and afterwards varnish and polish it. Chairs of this sort are made in great numbers in Buckinghamshire, where there are extensive beech woods. The commoner sort are generally nailed together, but the best are screwed or mortised, as in figs. 654 and 657. The bottoms are made of cane, with the exception of fig. 654, which is covered with leather. These chairs are generally painted and varnished; but they are sometimes stained either black mahogany colour, or a rosewood pink. We shall give the processes from *Partington's Builder's Guide*.

651

641. *For a deep Black*, the wood is brushed over four or five times with a warm decoction of logwood, made by boiling one pound of logwood for an hour or more, and afterwards as often with decoction of galls, allowing it to dry thoroughly between the several applications of the liquor: thus prepared, it receives a fine deep colour, from being washed over with a solution of vitriol, in the proportion of two ounces to a quart: in the room of which some use a solution of iron in vinegar, keeping the vinegar for this purpose upon a quantity of the filings of the metal, and pouring off a little as it is wanted. A pretty good black is also obtained, more expeditiously, by brushing over the wood, first with the logwood liquor, and afterwards with common ink.

642. *A very fine Black* may be produced by brushing the wood over several times with a solution of copper in aquafortis, and afterwards with the decoction of logwood (Hæmatóxylon campechiénse), repeated till the colour be of sufficient force, and the greenness produced by the copper overcome. The blacks may be varnished as the other colours.

643. *A light red-brown Mahogany colour* may be given to wood by means of a decoction of madder and fustic wood (the wood of Maclùra tinctòria), ground in water, in the proportion of half a pound of madder and a quarter of a pound of fustic wood, to a gallon; or, instead of the fustic wood, an ounce of yellow berries (the berries of *Rhámnus tinctòrius*) may be used. Brush over the wood with this solution, while boiling hot, till the due colour be obtained. Nearly the same effect may be produced by a tincture made by dissolving an ounce of dragon's blood in a pint of spirits of wine; and a similar tincture of turmeric root (*Curcùma* lónga), made by putting an ounce of the powdered root to a pint of spirits of wine, and after it has stood some days straining off the mixture.

644. *For a dark Mahogany*, take the infusion of madder as above, and substitute for the fustic wood two ounces of logwood: and when the wood has been brushed over several times, and is dry, wash it over with water in which pearl ashes have been dissolved, in the proportion of a quarter of an ounce to a quart. The wood, in the better kind of work, should be afterwards varnished with three or four coats of seed-lac varnish; but, for coarse work, resin and seed-lac varnish may be used, or the articles may be well rubbed over with drying oil.

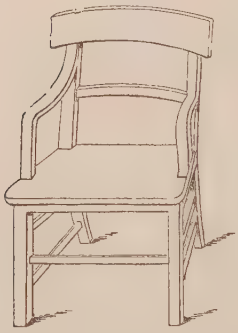
645. *Wood may be stained Yellow* by the above tincture of turmeric root, or by a tincture of yellow berries applied boiling hot; the wood, when dry, being brushed over with weak alum water, used cold.

646. *For Rosewood Pink*, make an infusion of a pound of Brasil wood (Cæsalpínia brasiliénsis) in a gallon of water impregnated with pearl ashes, in the proportion of an ounce to a gallon of water. The infusion should be frequently stirred, and should stand two or three days. When wanted for use, two ounces more pearl ashes should be added, and the mixture strained, and made boiling hot. It should then be applied to the wood, which should be afterwards brushed over with alum water, made in the proportion of two ounces of alum to a quart of water.

647. *Elbow Parlour Chairs in the Grecian Style.* Figs. 658, 659, and 660, p. 314, are Grecian elbow chairs with stuffed seats. Fig. 660, has a workbag under the seat, which draws out on one side; and on the other a slide, which serves as a table. These chairs may also be made of beech or birch, and stained or painted like the other. The silk or glazed cotton, for the workbag and the covers for the cushions, should be of the same colour as the window curtains and the cover of the sofa, if there be one in the room.

648. *Gothic Parlour Chairs.* Fig. 661 to 666, p. 323, are Designs for chairs made of beech; the first with a rush bottom; the second, third, and last with cane bottoms, and the two others with stuffed bottoms. Figs. 667 and 668, p. 323, are Gothic elbow chairs with stuffed bottoms. Fig. 669 is a Gothic chair, with a workbag and sliding board for table. All these chairs may be made of any strong fine-grained wood, mortised together, and afterwards painted and grained in imitation of oak. In the construction of chairs, care should be taken that the feet of the back legs should always spread out an inch at least more than the top rail of the back, in order to keep the latter from touching the wall, or paper, or window, when set against it.

649. *Bed-room Chairs.* These are of two kinds; a light sort for common use, and strong elbow or easy chairs for times of sickness. The light chairs may be any of those frames figured in p. 314, but with rush instead of cane bottoms. Figs. 670 and 671 are two strong elbow chairs for the use of a labouring man, when confined to his bed-room. Pillows may be put in them as cushions, both for the seat and back. Fig. 672 is a bedside chair of the same description, with a cupboard beneath for containing a night convenience of the simplest description. Such a chair ought to be in the bed-



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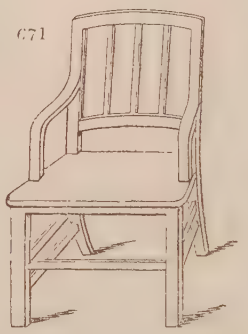

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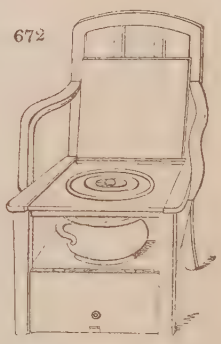
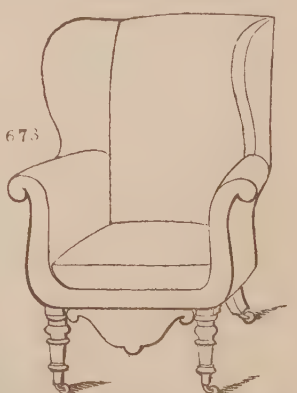


room of every cottage. Fig. 673 is a very comfortable easy chair, stuffed in the back and sides, with a movable cushion as a seat; beneath which is a night convenience.

650. *A Sofa* is a piece of furniture which affords a great source of comfort to its possessor; and therefore the cottager ought to have one as well as the rich man. Let him strive to obtain it, for no parlour is completely furnished without one; and he will certainly succeed. We shall give some Designs for sofas, and also for sofa-bedsteads, which we hope will come within the reach of many cottagers; and shall commence with figs. 674 and 675, p. 324, which are Designs for sofas of a superior description. Fig. 674 is in the Gothic style, with castors sunk in its legs, a great improvement with regard to appearance. We may here observe, generally, that good castors are essential to the convenient use of every piece of furniture to which they are applied. Many persons, by saving a few shillings in castors, deprive themselves of the full enjoyment of what, if easily moved, would be a most useful piece of furniture; besides which,



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bad castors destroy the carpets of sitting-rooms, and scratch the boards of bed-rooms. Purchasers of furniture, who are no judges in this respect, are often deceived; for of two articles of furniture, exactly the same in size and appearance, one may

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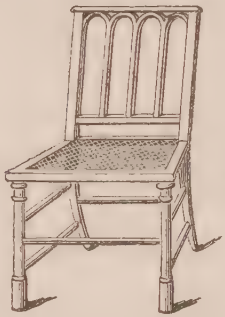

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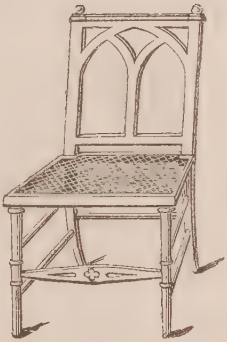

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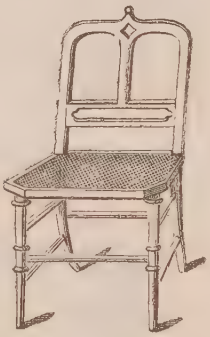

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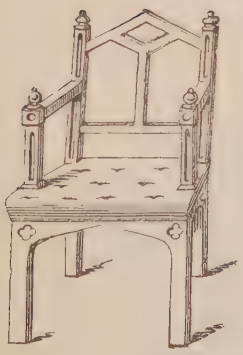

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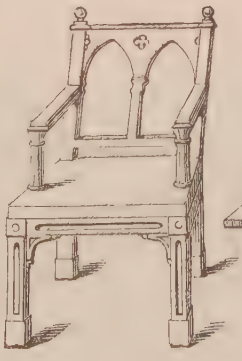

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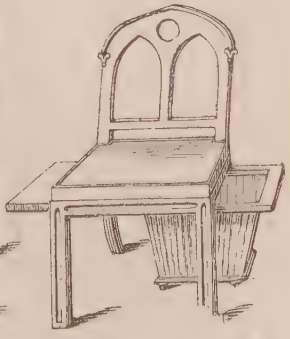

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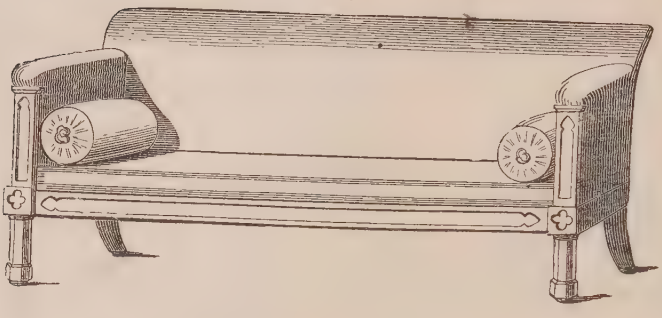

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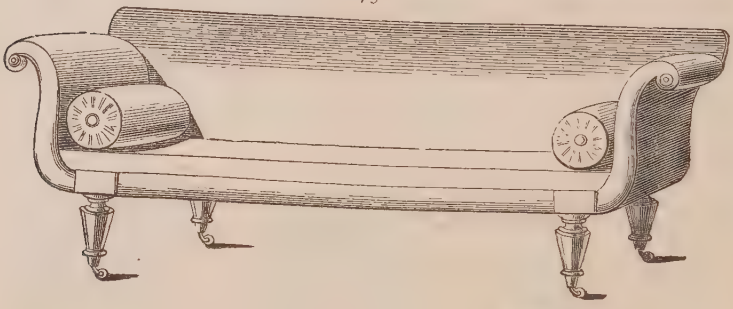

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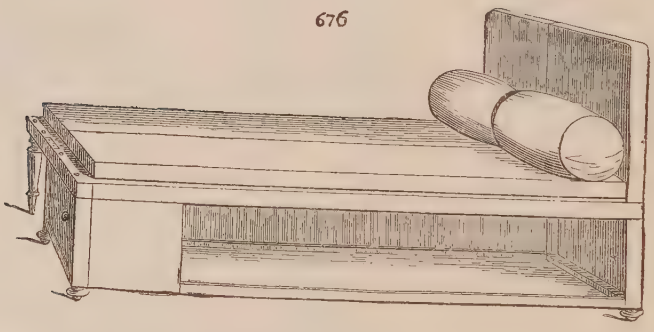

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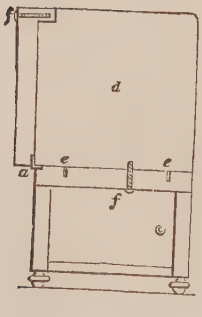

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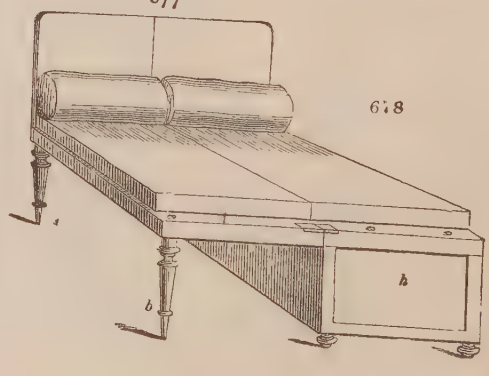

be sold by a manufacturer for a pound sterling less than the other, merely from his having employed in it the most common, instead of the best, description of castors. We are informed by Mr. Dalziel, who is extremely particular to use only the very best materials in all the articles which he manufactures, that the best castor at present in use is that of Cope of Birmingham. This is a ball working in a cup, something in the manner of Mr. Mallet's iron castor; and the more pressure there is on it, the easier it works. The cushions and mattresses of sofas are commonly stuffed with hair or wool; and sometimes, for cheapness, with chaff, chopped hay, or straw, or bran; but an article has been lately introduced into this manufacture, which is found to answer as well as baked hair, and not to cost above a third of the expense. This is the Zostèra marìna, or sea wrack grass, found on the coast of Norfolk; abundantly in the Orkneys and Hebrides; and on the northern shores of the German Ocean. When gathered, it is repeatedly washed in fresh water, to deprive it of all its saline particles; and, being afterwards dried in the sun, it is twisted into thick ropes, and in that state sent to the manufacturer, who has it untwisted, and cut into short lengths for use. Whatever material is used for stuffing, it is first enclosed in strong canvass, and afterwards covered with black horse-hair, moreen, or damask, nailed on with brass-headed nails, or with a loose cover of printed cottons or other stuffs. A very cheap and yet tasteful loose sofa cover may be made of glazed self-coloured calico, with a narrow piece of different coloured calico, or shawl bordering, laid on about a couple of inches from the edge. This kind of cover lasts clean much longer than one of common printed cotton; and, when the bordering is carried round the covers of the cushions, bolsters, &c., it has a pretty and even elegant effect. In all cases where the covers of sofas are made of a material which admits of a choice of colours, those should be preferred which prevail in the carpet and window curtains of the room; the principal reason in this, and all similar cases, being, that such a choice indicates unity of design.

651. *Sofa Beds.* Sofas which may be converted into beds are most convenient articles of furniture for cottages and other small dwellings. Fig. 676, p. 324, shows a bed formed out of a sofa of this description. The back of the sofa is hinged, as shown in fig. 677, at *a*; and it falls down, and is supported by two portable legs, fig. 678, *b*, *c*: these legs are tapped and screwed into the top rail of the back (that is, a screw is formed on the upper end of the leg, and, a hole being bored in the rail, nearly of the same diameter as this screw, an instrument called a tap is introduced into the hole, and being turned round, grooves out a path for the screw; this path, or screw groove, is called the female screw, and that which goes into it, the male screw). The end, *d*, is made to shift; it is fastened to the side rail of the seat of the sofa by the two wooden dowels, *e e*, which go into the rail, and is secured to the back and bottom by two thumb screws, at *f f*. When the bed is used, this end is shifted to that opposite, in order to form the head of the bed; the end style of the back of the sofa having holes to receive the same dowels and thumb-screws, so as to retain it in its place. Underneath the sofa there is a well for the legs, fig. 676, *g*, which may either open to the front or the back, and may be either concealed by the valance of the sofa cover, or by a movable panel of wood. There is a cupboard which opens at one end, as seen at *h*, in fig. 678. Fig. 679, p. 327, is a view of a sofa which may be turned into a bed with posts and curtains. Fig. 680 shows

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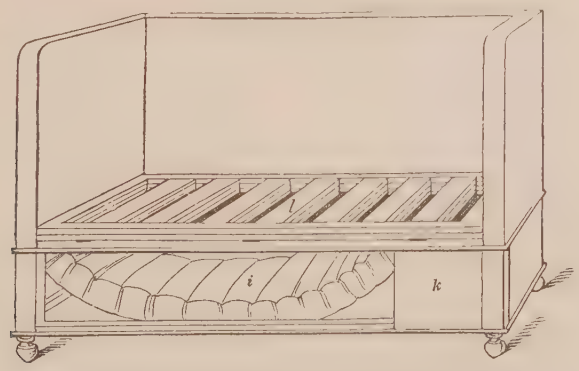

the first process, that of removing the sofa cover, mattress, and cushions of the seat, and the mattress of the back. Here is seen a third mattress, *i*, which is kept in a well underneath the seat, and sufficiently long to hold it in a curved though not in a straight position. The remaining part of the space underneath the seat is occupied by

a cupboard, *k*. Under the cushions which form the seat of the sofa, and above the well, may be seen the folding frame, *l*, which forms the bottom of the bed. Fig. 681 shows

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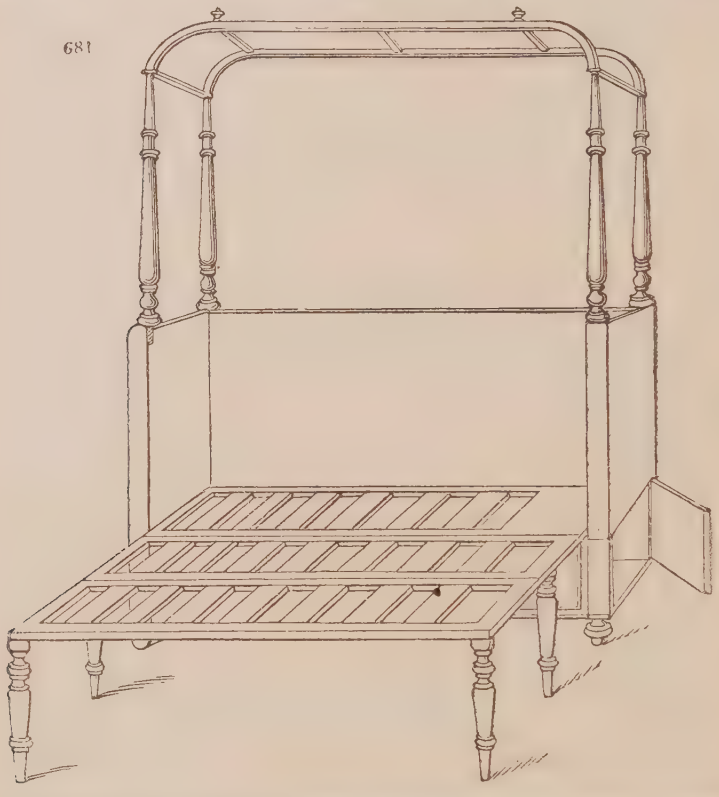

this folding frame opened out, and supported by four portable legs, tapped and screwed into its sides. The bedposts are, in like manner, tapped and screwed into the top rails of what formed the sofa ends; and the tester laths, and their side pieces, forming the top, drop on to iron pins inserted in the upper ends of the bedposts. The legs, the posts, the tester laths, and side pieces, all go into the same well as the mattress, when not in use; and when the sofa cover is on, it completely conceals the holes which receive the bedposts, and also the well and the cupboard. Fig. 682, p. 327, shows the bed with the mattresses and bolsters laid in their places, and the curtains put up. This is a very desirable description of sofa bed to have in a cottage parlour, or, indeed, in any small dwelling either in town or country. The cost, complete, in London, is from £10 to £15. There are also chair beds, which are formed by drawing out a frame from under the chair, so as to triple the length of the seat; on which frame are arranged the cushions which were previously placed against the back and sides of the easy chair. The bottom of the chair may be formed into a cupboard to open at the side.

652. *Beds* of other descriptions may be classed under the following heads: folding or camp beds; stump, press, and half-tester bedsteads; couch, box, and French beds; tent and four-post bedsteads, and children's cribs. In our opinion, those cottagers who can afford to have good furniture are often disproportionably extravagant in the article of beds and bedding. In Scotland and France, where the cottager's parlour has frequently a bed in it, luxury in this article may perhaps be excusable; but in England, where the bed-room of a cottager is seldom entered by a stranger, we think it would be a wiser economy to have the bed plain, though, in all respects, comfortable, and to expend any surplus money, which might have been spared from it, on the furniture of the parlour. However, we make the remark with great deference to the opinion of the cottager's wife, who must be allowed to be the best judge on the subject.

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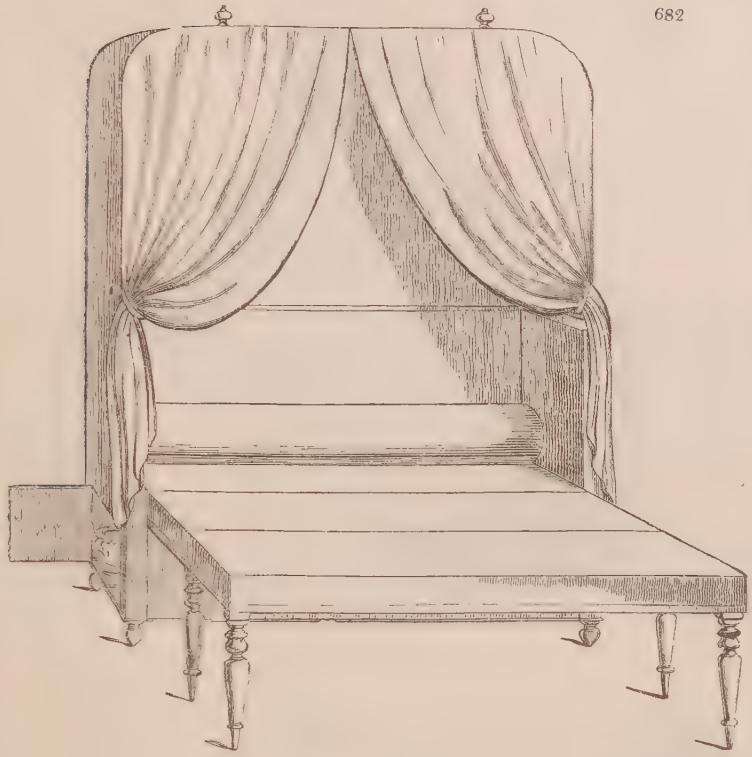

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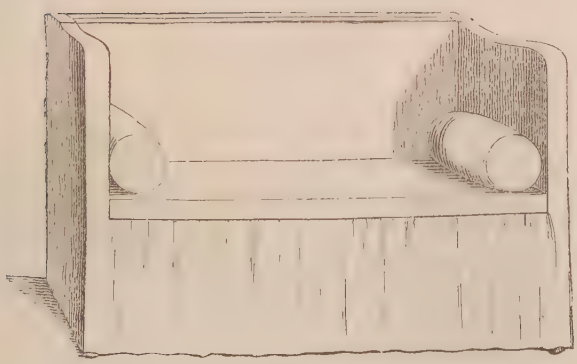

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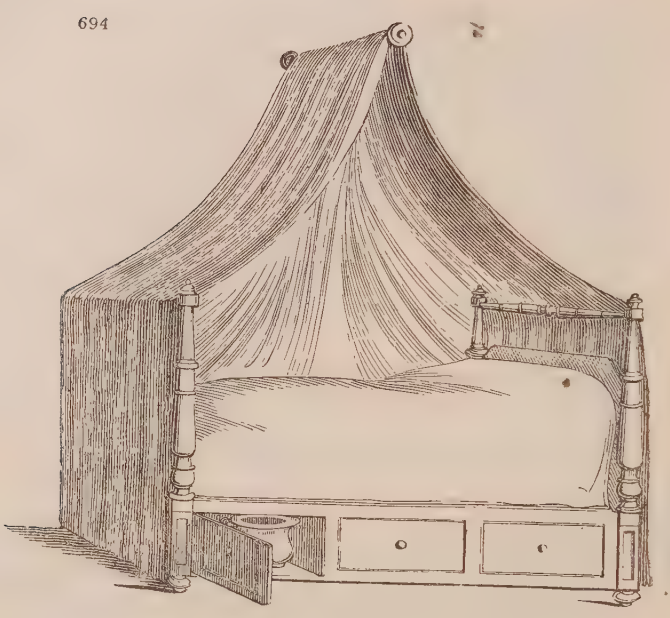

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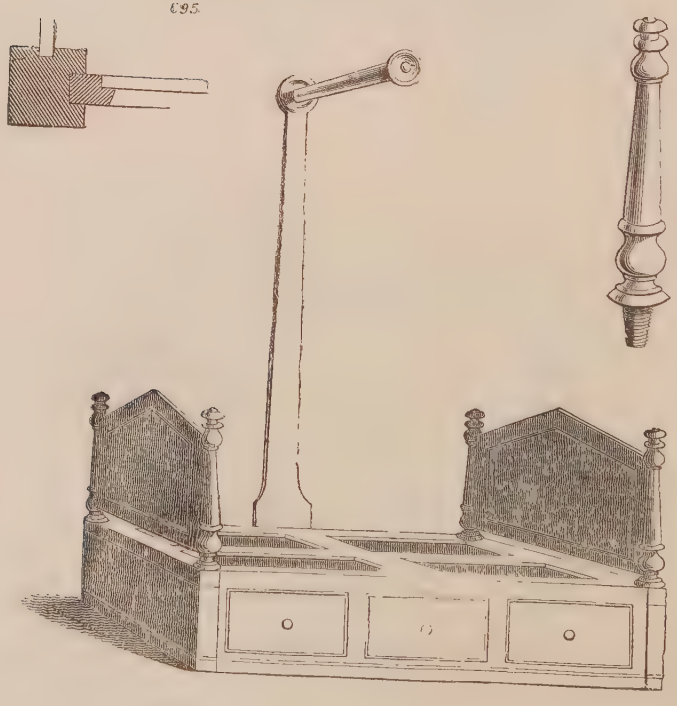

653. *Folding Camp Bed.* This is one of the cheapest of all beds; and when the sides and feet are made of iron rods, with no wood but the head board, it goes in very little bulk, and costs complete, with sacking, not more than 15*s*. Fig. 683, to a scale

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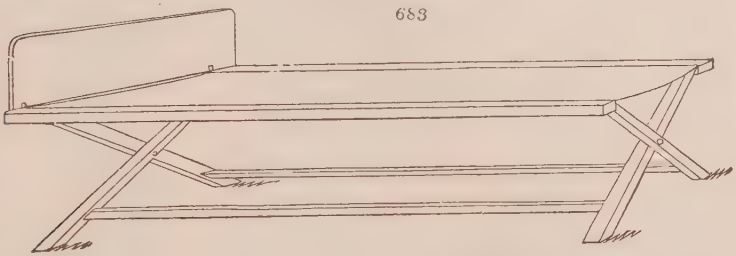

of half an inch to a foot, is a view of a folding bed, with the sides and feet made of wood, which may be manufactured complete, in London, for £1. The head board has two iron pins in its lower edge, which drop into holes made in the side-rails of the bed. When a cottage is small, we recommend all boys to be made to sleep on beds of this kind, which they ought to be taught to fold up and put away in the morning, as soon as they get up; and to bring out and make up for themselves at night. The boy or lad who cannot sleep soundly on such a bed must have something either physically or morally wrong in his constitution; and is, in either case, not very likely to become a man capable of earning his bread by labour.

654. *Stump Bedsteads* are common in the humblest description of dwellings in England, both in town and country. They are commonly made of wood, with sacking bottoms; but as these materials are apt to harbour vermin, they have lately been manufactured entirely of wrought iron; the place of the sacking or canvass bottom being supplied by interwoven thin iron hooping, as shown in fig. 684, which is manufactured by

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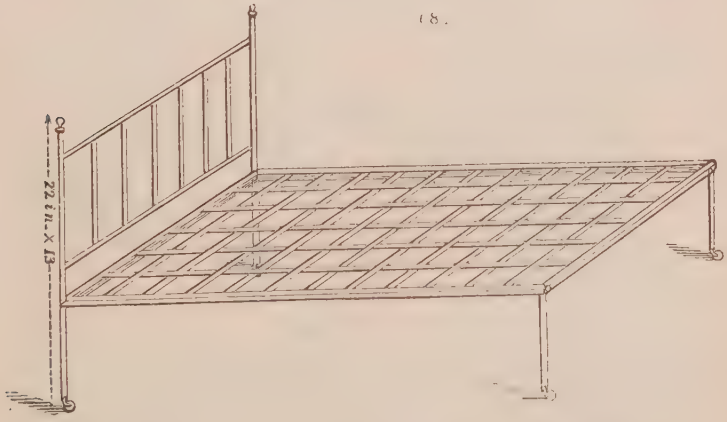

Messrs. Cottam and Hallen of London, and sold complete with castors, when two feet six inches wide, for one person, at 23*s*. each; and at a proportionate increase of price, according to the width, up to 33*s*., which is the price of an iron stump bedstead five feet wide.

655. *Press Bedsteads* are very common in kitchens, and, sometimes, in parlours where there is a deficiency of bed-rooms; but they are objectionable, as harbouring vermin, and being apt soon to get out of order when in daily use. They have, however, one advantage, which is, that persons sleeping in them are generally obliged to get up betimes in the morning: we, therefore, present one Design. Fig. 685 is a view of the press when the bed is put up. There is a cupboard shown at one end, and the remainder of the lower part is occupied by a drawer which is made to appear like two externally, in order to form to a regular front, with that of the cupboard. Fig. 686 shows the manner in which the bedstead folds up: *a* is one of the feet, which is

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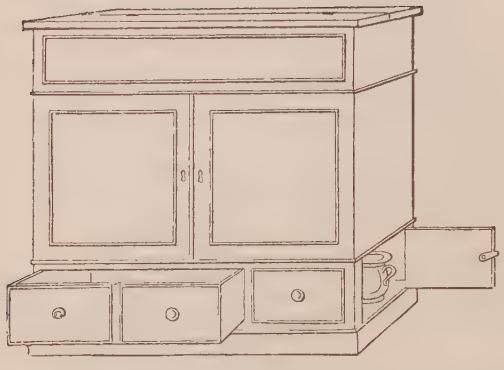

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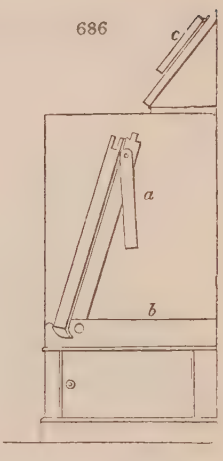

hinged on an iron pin, and is seen when down, as in fig. 687. The other two feet, *b b*, in fig. 687, are placed, when folded up, as shown in the section, fig. 686, at *b*; *c*

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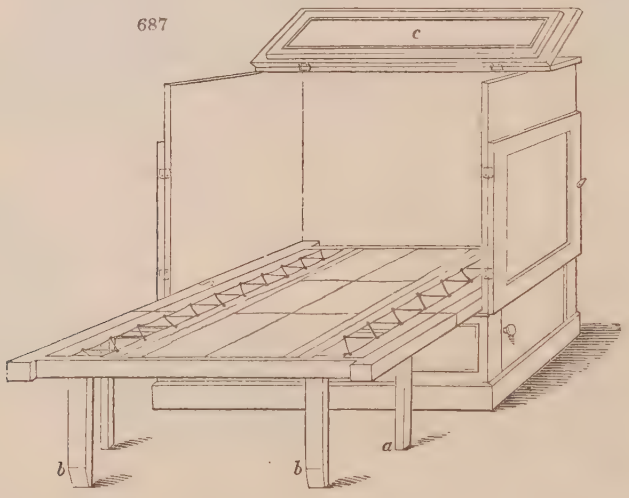

represents part of the front and top, lifted up and folded back. Press bedsteads are sometimes made to imitate a chest of drawers, or a secretary, in front; in order, if possible, to prevent the real use of the article from being discovered: a proof that beds of this kind are not held in much repute; because they indicate a deficiency of bed-rooms.

656. *Half-Tester Bedsteads* are used in small rooms, where it may be desirable to turn them up during the day, in order to allow the occupant to work in the room. They have this advantage over press beds, that they are turned up and let down with very little trouble; and that when turned up, and the curtain drawn round them, they are by no means unsightly objects in a room which is to be considered as a bed-room; but they are quite inadmissible in a kitchen or a parlour. Fig. 688 is a Design for a half-tester bedstead, with the posts, rails, and feet of wood, and the bottom of sacking. It is shown in this figure as turned down, and ready to receive the mattress and bedding. In fig. 689 the bed is shown turned up, by which it appears that the turned legs, *d d*, are hinged and fold down, so as to occupy less space. The manner in which the curtain rod is fixed is also here shown. It is fastened to the lath at the middle of the front, at *e*, and at both its extremities an eye is formed, which drops on a hook, as shown at *f*. The fixed feet are always placed in an inclined position, to give greater steadiness to

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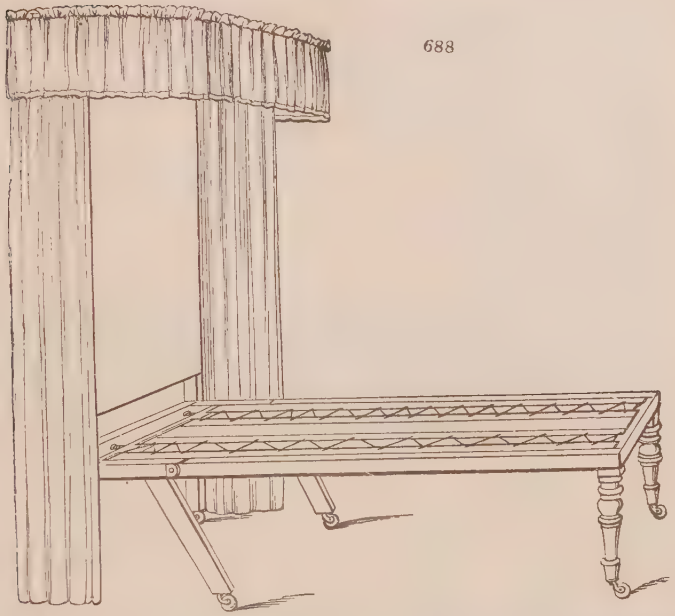

the bed. they are shown straight in fig. 688, and curved in fig. 689, to indicate that they may be made either way. Fig. 691 is an iron half-tester bedstead, which, however, does not fold up, but which has the great advantage of being remarkably cheap. It is manufactured by Messrs. Cottam and Hallen, of two feet six inches in width, for 46*s.* 6*d.*; and of five feet in width, for 68*s.*: in both cases it is complete, with castors, head board, and curtain rods, and is thrice painted in oil. Fig. 692 is another wrought-iron half-tester bedstead, one half of which folds over the other: it is the invention of Mr. William Mallet of Dublin, who, we are informed, has made many thousands of them. In this bedstead both the head board and the foot board are of iron. Fig. 690

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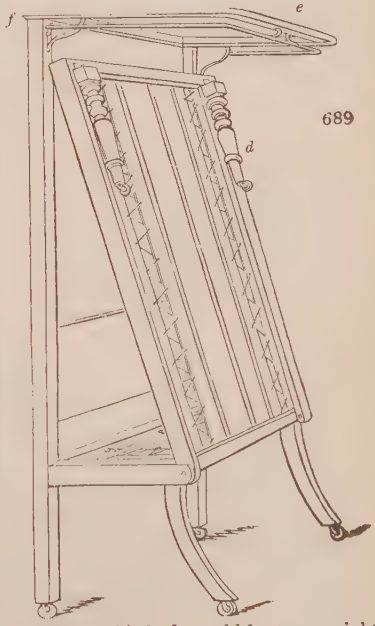

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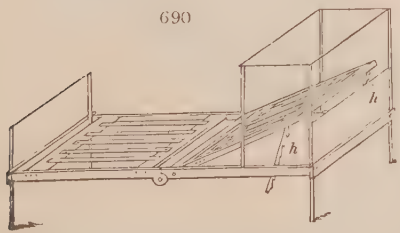

is a different modification of the same bedstead, intended for sick persons, which is made to rise with racks, *h h*, so as to place the patient, though still recumbent, at any angle that may be required. An important addition to this bed would be two upright rods, one on each side, about half way between the head and foot, securely joined together by a strong rod at top, so as to be perfectly firm; from this top rod a cord,

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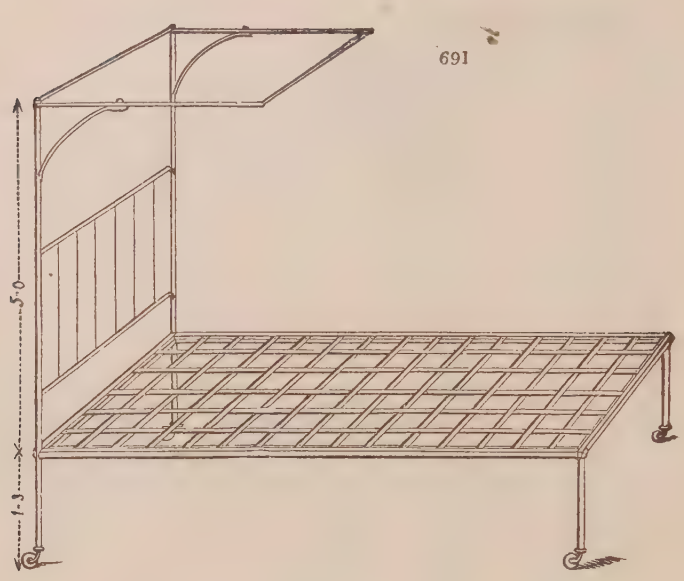

sash, towel, or piece of girth webbing, might be suspended, or even a hooked walking-stick put on, for the bedridden patient to take hold of, to assist him in turning, or otherwise changing his position. Every person who has been long confined to a bed knows that this simple contrivance is the most valuable part of a sick man's bedstead; and it is one reason why the beds of all elderly people should have bedposts and testers, because from the centre cross laths this simple contrivance, for the comfort of an invalid, may be suspended. Both figs. 690 and 692, we are informed, can be afforded for less than the price of the frame of a common wooden bedstead.

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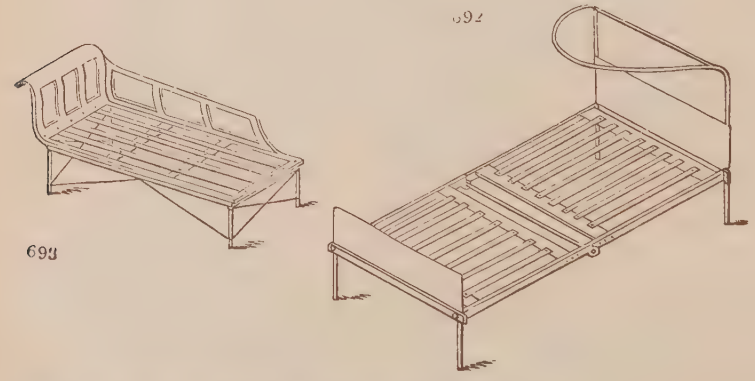

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657. *Couch Beds* may be described as sofas used as beds; and, for our parts, we prefer them to either the press or the half-tester bedstead. They are very common in France and Germany. Fig. 693 is a Design, by Mr. William Mallet of Dublin, for an iron couch bed frame. The head is cast in one piece, the back in another, and the frame in a third. All the rest is of wrought iron; the four legs of gas pipe, the braces of quarter-inch wire, and the bottom of iron hooping. Castors might easily be added; and this Design would then form a suitable article for some descriptions of cottages.

658. *Box Beds* are common in the better description of cottages in Scotland, and also in Alsace, Lorraine, and other parts of the north of France, and in Holland and Flanders. This bed is of the usual length, and in general four feet wide within. There are four

square posts, at the four corners; and the back and ends are filled in with boarding grooved and tongued; while the front is formed into panels, one of which at top and another at bottom are fixed, and two between them slide in grooves, and form the door of the bed. The roof is of boards, and the bottom of laths, three inches wide, and about two or three inches apart. There is generally a shelf, and sometimes two, fixed to the inside of the bottom of the bed, just above the bedclothes; and sometimes there is one at top, close under the roof. There are also sometimes one or two shelves against the back of the bed; so that this piece of furniture not only serves as a bed, but as a wardrobe and linen chest. In some parts of the country the bed doors fix within by bolts, or have a lock to fasten them on the outside; so that a person going to bed, with all his treasure round him on the surrounding shelves, may secure it while he is asleep at night, or going out to work in the daytime, by bolting or locking the doors. These box beds can be easily taken to pieces, and put together again; the ends, backs, and roofs being in separate pieces, and fitting into grooves in the posts, and in the top and bottom rails, in the manner of Manning's portable cottages, § 512. Besides serving as a wardrobe, &c., a box bed may be made to supply the place of a partition, two of them being often placed, in Scotland, as well as in Alsace, across any apartment of fourteen or fifteen feet in width, which they thus divide into two rooms (a *but* and a *ben*), leaving a passage between them. In roomy cottages, four are sometimes so placed back to back; thus giving two beds to be entered from the kitchen, and two from the parlour. A bed of this sort, well made, was formerly considered the principal article in a Scottish cottager's furnishing; and this is still the case in Alsace and Lorraine, as we learned when we visited those countries in 1829. Something might be made of these beds in any country where the cottager's house is his own, and where he is likely to be a permanent resident; but they are too costly, and too cumbersome, for a tenant at will, or on a short lease.

659. *French beds* are generally formed like couch beds, especially those in use by French cottagers. Fig. 694, p. 328, shows a French bedstead of an improved description, with the furniture complete. There are two drawers underneath, and a small cupboard, all of which open from the front; because the furniture would be in the way if they opened at the ends. There is a turned rail above the headboard, to keep the furniture from the face; and another over the footboard, to be uniform with it. The pole which supports the curtain is screwed into an upright piece, which is securely fixed by a mortise and tenon to the back rail of the bottom of the bedstead, as shown in fig. 695, so that the bedstead and furniture can be removed from the wall. Castors may be introduced into the four pillars, so as not to be seen. It will be observed that the Design of fig. 695 is different from that of fig. 694: both may be considered elegant, and well adapted for a superior description of cottage. These bedsteads may be made of deal, and painted, with the exception of the upright piece, which should be of beech or some other stiff wood. Fig. 696 is a French bedstead of wrought iron, which costs

696

when two feet six inches wide, 46*s*., and when five feet wide, 84*s*. The curtains, in this case, are supposed to be thrown over a pole, projecting from the wall, and supported by a bracket.

660. *Tent Beds* are in universal use, and scarcely require description. Fig. 697, to a scale of three eighths of an inch to a foot, shows the framing or woodwork of the bed:

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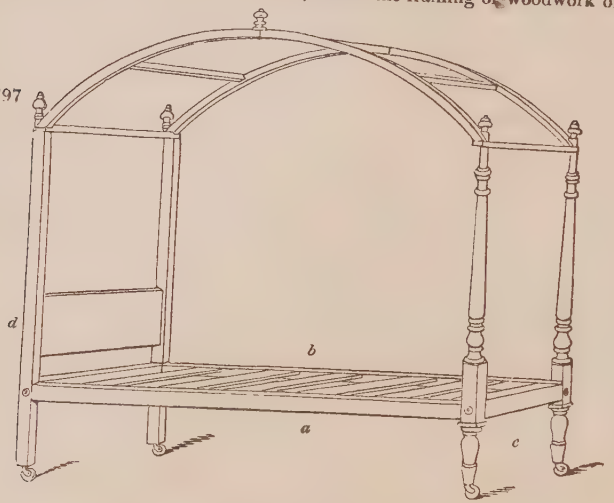

a, *b*, *c*, is the bed frame, *a* and *b* being the side rails, and *c* the bottom rail; *d* is the head-board which fixes into a groove in the head posts. These posts, being intended to be covered with that part of the bed hangings called the head piece, are made plain; while the bottom posts, which are intended to be exposed, are generally turned or covered. Fig. 698 is a tent bedstead with the curtains complete. Fig. 699 is an iron

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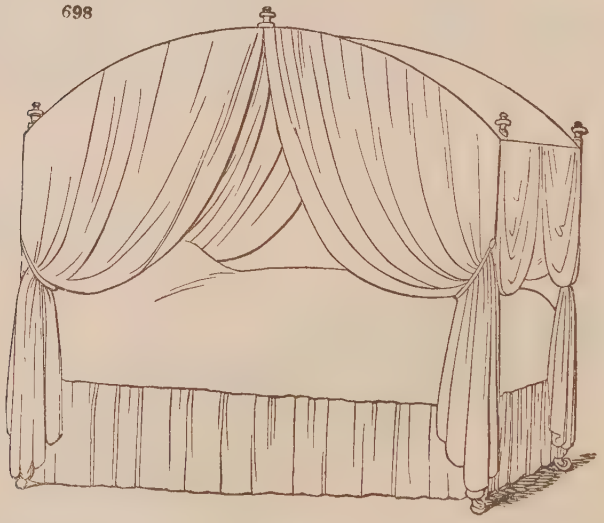
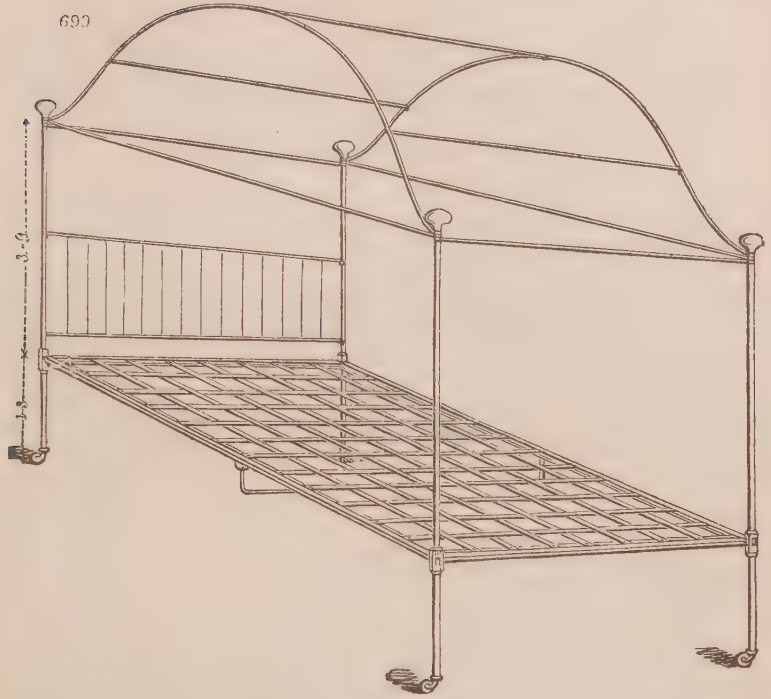
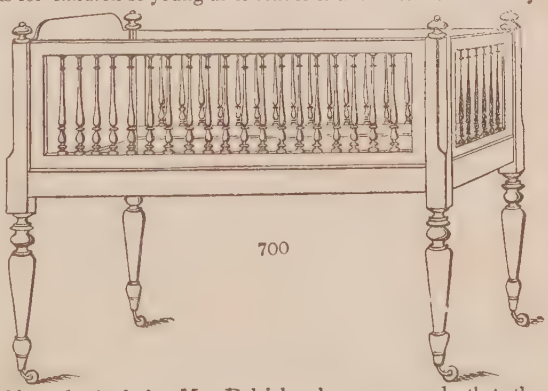


tent bedstead, manufactured by Messrs. Cottam and Hallen, which costs, when two feet six inches wide, 56*s*. 6*d*., and when five feet wide, 77*s*.

661. *Four-Post Bedsteads* are more suitable for villas than for cottages, except perhaps the cheap and excellent ones made of wrought iron, which do not cost much more than a tent bed of the same materials. Four-post bedsteads, however, of every description, are objectionable for cottagers, both on account of the room they take up, and the quantity of bed furniture which they require.



662. *Cribs* are bedsteads for children so young as to render it unsafe to trust them by themselves in beds with unguarded sides. They are generally intended to be placed, during the night, by the bedside of the mother; and, for that purpose, the height of the crib should correspond with that of the large bed, and one of its sides be made to lift out. This is effected by grooves in the upright posts, with tongues on the end styles of the side. Fig. 700 is a Design for a crib in the Grecian style, and fig. 703. for one in the Gothic style, both by Mr. Dalziel, who recommends that the heads of the bed-screws, with which fig. 700. is screwed together, should be concealed by a wooden cap, fig. 701, instead of by a brass one, as is commonly done. In the leg of the Gothic crib, fig. 703, the screw is concealed by means of a small wooden panel made to take out. The turned rails of the sides, in fig. 700, and the plain rails in the Gothic Design, are considered better than the open canework usually employed for crib sides, through which children are apt to put their fingers and hurt themselves. Cribs are sometimes made with only one side, the rail on that opposite being held close to the rail of the large bed by hooks and eyes. Any joiner might make these cribs of deal, or any other cheap wood; and they may be painted or stained to harmonise with the bedstead and chairs of the room in which they are to be placed. Fig. 702 is a view of a cheap crib, the frame and bottom of which are formed of wrought iron,



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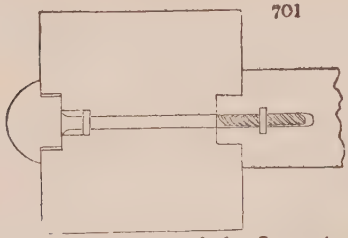

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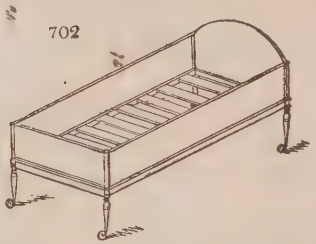

and the sides and ends of deal. It may be made for 15*s*. Swinging cribs and cradles are now justly exploded.

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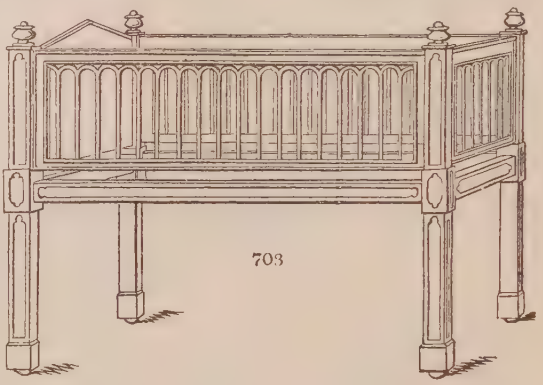

663. *Bedding* includes palliasses, or straw mattresses; hair, wool, or other mattresses; hay, chaff, or feather beds; bolsters, pillows, sheets, blankets, and counterpanes. The palliass is an inflexible mattress, stuffed with drawn wheat straw; placed as the lower layer of the bedding, for the purpose of raising it, and giving a more agreeable basis to the feather-bed. The common mattress is formed by stuffing a canvass case with flocks, wool, baked horse-hair, sea grass, technically called *Ulva marina*, or any other articles which when put together form an elastic body, and afterwards quilting it down, and covering it with a description of cloth called ticken. The feather bed and the pillows are stuffed with feathers. In Scotland, mattresses and bolsters, exceedingly agreeable to sleep upon, are stuffed with the outer chaff of the oat, carefully sifted from the smaller chaff, and from all dust, and renewed once a year. In Italy, and in countries where the maize is in common culture, excellent mattresses are formed by stuffing them with the chaff of that grain. A few flowers of the hop mixed with the chaff of the bolster gives that article an agreeable fragrance, which is at the same time soporific. George III. at one time slept on a pillow entirely stuffed with hops; and some years ago, when in Worcestershire, we think in 1815, we slept at a farm house, on a bed, bolster, and pillows, all stuffed with hops, and found that they formed a species of bedding soft and powerfully fragrant, though said to be unwholesome.

664. *Substitutes for Stuffing* to beds, bolsters, and pillows have been proposed by upholsterers at different times, and some of them have lately been a good deal used: of these we shall mention three; viz., wire springs, air, and water.

665. *Wire Springs* for stuffing are nothing more than spiral coils of wire, fig. 704, generally an eighth of an inch in diameter for mattresses, and smaller for cushions, carriage seats, &c. These springs are placed, side by side, on interlaced webbing, strained to a frame of the size of the intended bed, cushion, or seat; they are then all confined by cords to one height, and covered by a piece of ticken or strong canvass, strained tightly over them. On this is spread a layer of curled horse-hair, and an upper cover of ticken is then put over the whole, and nailed down tight to the under side of the wooden frame with tacks. For our own part, we prefer beds made with these spiral springs to any other; not only from their greater elasticity, and the equal diffusion of the support which they afford to the body, but because, from the quantity of air among the springs, they can never become so warm as beds stuffed with any of the ordinary materials. The effect of spiral springs as stuffing has been long known to men of science; but so little to upholsterers, that a patent for using them in stuffing was taken out, some years ago, as a new invention. Beds and seats of this description are now, however, made by upholsterers generally, and the springs may be had from Birmingham by the hundred weight.

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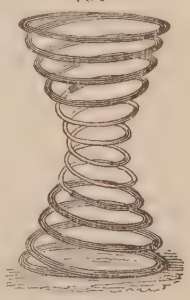

666. *Air Beds and Cushions* were invented by John Clark of Bridgewater, in 1813. He first renders the case of the bed, pillow, hammock, or cushion, impervious to air, by preparing it with caoutchouc; he next encloses it in another case not impervious to air, and afterwards forces the air into the inner case by means of an air-pump, preventing it from returning by an air-tight stopcock. He observes "that these beds afford the most renovating and easy repose; that they may be rendered soft to any required degree, and either cool or warm, by changing the air; that, on the general principle of fluids maintaining a uniform level, they are not subject to hard lumps or knots, like feathers, wool, or down; that they never can get damp; that they require no making up; that the largest bed weighs only a few ounces, and that, being exhausted, they may be folded or rolled up, so as to go in very little bulk, and hence their great advantage to travellers." For medical purposes, he says, "they may be filled with air at any required temperature; or with water, steam, or other fluids, either wet or dry, elastic or non-elastic, to which the case is impermeable. Seamen's hammocks, if filled with air, would be light, portable, and buoyant; and, in case of shipwreck, might be used as life preservers. Cushions, pads, and carriage linings thus, filled, will also be eligible and commodious, from their lightness and elasticity. (*Repertory of Arts*, vol. xxiv. p. 157.)

667. *The Hydrostatic Bed for Invalids* is a recent invention of that enlightened and benevolent physician Dr. Arnott, the author of the *Elements of Physics*, and is already coming into general use in the London hospitals. Its object is to mitigate all, and entirely to prevent some, of the evils attendant on remaining for a great length of time in a reclining posture. "The health, and even life, of every part of the animal body depends on the sufficient circulation through it of fresh blood, driven in by the force of the heart. Now, when a man is sitting or lying, the parts of his flesh compressed by the weight of his body do not receive the blood so readily as at other times; and if, from any cause, the action of his heart has become weak, the interruption of the circulation will both follow more quickly and be more complete. A peculiar uneasiness arises where the circulation is thus obstructed, impelling even a healthy person to involuntary changes of position: when the body is debilitated with sickness, however, these changes occasion much fatigue; and should the sensations after a time become indistinct, as in delirium, palsy, &c., or the patient have become too weak to obey them, the compressed parts are kept so long without their natural supply of blood, that they lose their vitality, and change to what are called sloughs, or mortified parts. These have afterwards to be thrown off, if the patient survive, by the process of ulceration; and they leave deep holes, which require to be filled up with new flesh during a tedious convalescence. Many a fever, after a favourable crisis, has terminated fatally from this cause; and the same termination is common in lingering consumptions, palsies, spine diseases, &c.; and, generally, in all diseases which confine patients long to their beds." (*Penny Mag.*, vol. i. p. 215.) Dr. Arnott, having tried various descriptions of beds contrived for invalids, including air pillows, down pillows, &c., thought at last of a hydrostatic bed. He "reflected that the support of water to a floating body is so uniformly diffused, that every thousandth part of an inch of it has, as it were, its own separate liquid pillar, and no one part bears the load of its neighbour; that a person resting in a bath is nearly thus supported; that a patient might be laid upon the surface of a bath over which a large sheet of waterproof India rubber cloth had been previously thrown, his body being rendered sufficiently buoyant by a soft mattress being placed beneath it; and that it might thus repose upon the surface of the water, without sensible pressure any where." (*Ibid.*) The hydrostatic bed is made of the usual dimensions; and is nothing more than a wooden trough, say four feet wide, six feet long, and one foot deep, lined with lead or zinc, to render it water-tight. Over this is thrown a sheet of India rubber cloth, as large as would be a complete lining to the box if it were empty. The edges of this sheet are secured by narrow slips of wood, or tinned iron hooping, firmly screwed down all round the top of the trough, shutting in the water as completely as if it were in a bottle, the only opening being at one end, which is filled by a cock. Upon this India rubber sheet a mattress, pillow, and bedclothes are laid, as in common beds. The box may be made by any carpenter, and lined by any plumber, and the India-rubber cloth is manufactured by Mackintosh and Co., Charing Cross.

668. *Bed Furniture.* The usual material for the hangings of cottage beds, especially for tent beds, is dimity, which has the advantage of being easily washed, and may thus be always contrived to have a clean appearance. Printed cottons, Manchester stripes, and chintzes are also very suitable, particularly the latter, for French beds; but moreens and other woollen stuffs should never be used in cottages, as they have not only too heavy an appearance for a small room, but are liable to harbour dust and vermin. The furniture of the bed, and the curtains of the windows of the room in which it is placed, should always be of the same material and colour.

669. *Window Curtains* give such an air of comfort to a room, whether it be to the

spectator from without, or to the occupant within, that we could wish no cottage, however humble, to be without them. For the same reason, we should wish cottage windows to be large, that the curtains may be displayed without too much obstructing the light. Window curtains give the mistress of the house an excellent opportunity for exercising her taste in their arrangement; and it is but doing justice to the French and Germans, to state that they are far in advance of the British, or, indeed, of any other people of Europe, in this particular. From Stockholm to Naples, the room of a Frenchman may always be known, before entering it, by the curtains of his window. It is not that they are formed of expensive materials, for these are seldom employed, except in a superior description of houses; but muslins, cottons, and lenos, of different colours, sometimes accompanied by shawl bordering, sewed upon the cottons, are put up with a degree of style and taste which indicates both talent and a love of home in the occupant. It would be easy to introduce the same taste in Britain, if it were once properly pointed out to young females, and exemplified by the comparatively enlightened cottager; for example, in the dwellings of the married upper servants of country gentlemen. The first step, however, is to have large windows. Fig. 705, p. 339, is a very plain style of hanging curtains. A round pole of wood is supported at each end by a bracket, fig. 706 *a*,

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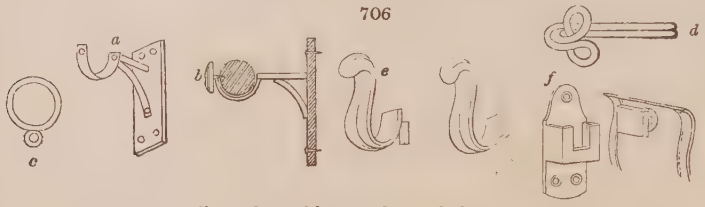
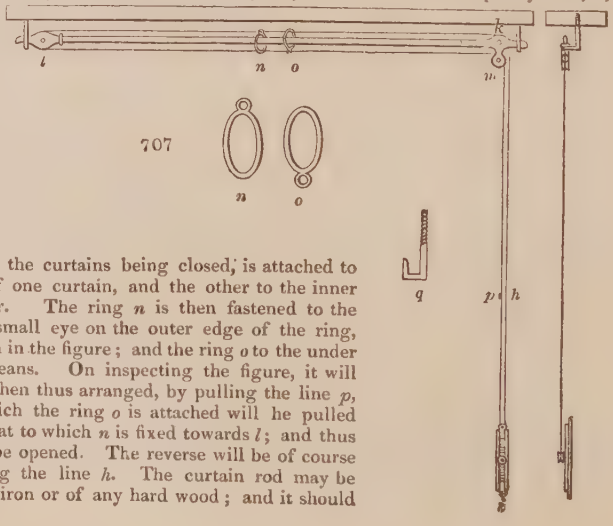


which is fixed by screw nails to the architrave of the window. The pole is kept securely in its place by the screw-pin, *b*, which passes through the bracket, and is screwed into the pole so as to keep it quite firm. On the pole are fourteen rings, generally of brass, but for a common cottage they might be made of iron bronzed; and in the lower part of each ring there is a small eye, *c*, in which is inserted the end of the wire hook, *d*, which is sewed along the inside of the upper margin of the curtain. By these means the curtain can be unhooked, and taken down to be cleaned at any time. The curtain, when not drawn, may be supported by a wooden pin, by a brass pin, by a brass band, *e*, which fits into a socket, *f*, and will stand either upright, or horizontal, at pleasure, accordingly as the square tenon of the band may be introduced. In fig 705, this band is shown at *g g*, placed horizontally; in fig. 706 it is shown placed upright. Instead of a pin or band, a piece of riband or curtain line, with a ring on each end, might be hooked on two knobs, and thus loop up the curtain. The manner in which this curtain, which opens in the middle, is made to draw from the centre to each side of the window, is shown in fig. 707. A line, *h*, is passed round the small pulley which works in the pulley rack, *i*; it is then carried over another pulley at *k*; then over a third at *l*; and a fourth at *m*, returning to the pulley rack, where it is joined to its other end. There are two rings at *n* and *o*; one of which, the curtains being closed, is attached to the inner edge of one curtain, and the other to the inner edge of the other. The ring *n* is then fastened to the upper line, by a small eye on the outer edge of the ring, which may be seen in the figure; and the ring *o* to the under line, by similar means. On inspecting the figure, it will be evident that, when thus arranged, by pulling the line *p*, the curtain to which the ring *o* is attached will be pulled towards *m*, and that to which *n* is fixed towards *l*; and thus the curtains will be opened. The reverse will be of course effected by pulling the line *h*. The curtain rod may be formed either of iron or of any hard wood; and it should



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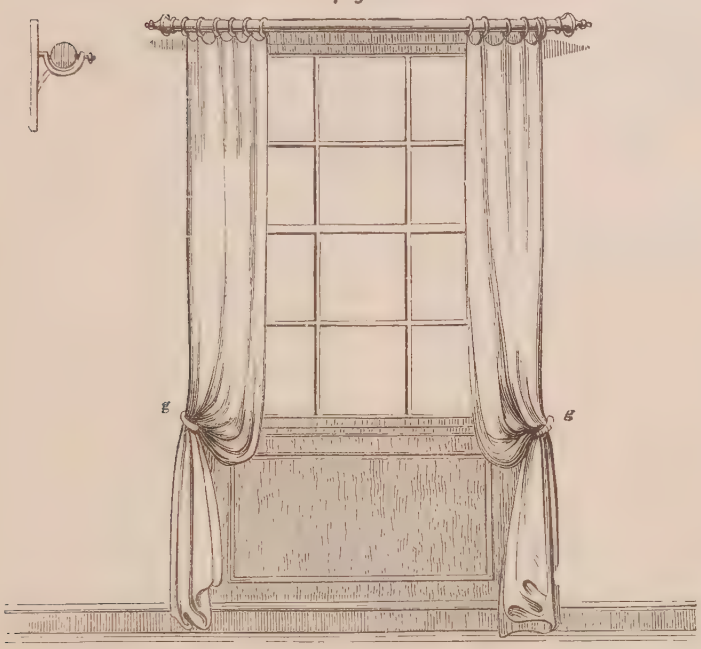

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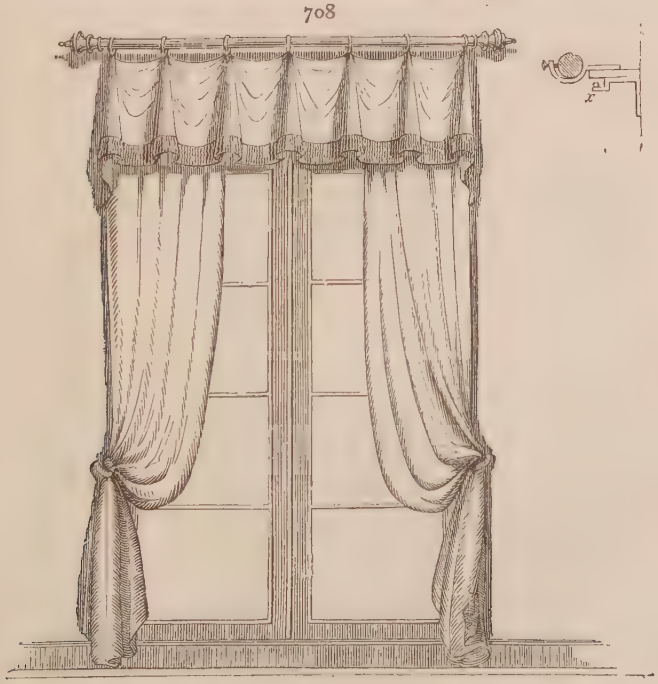

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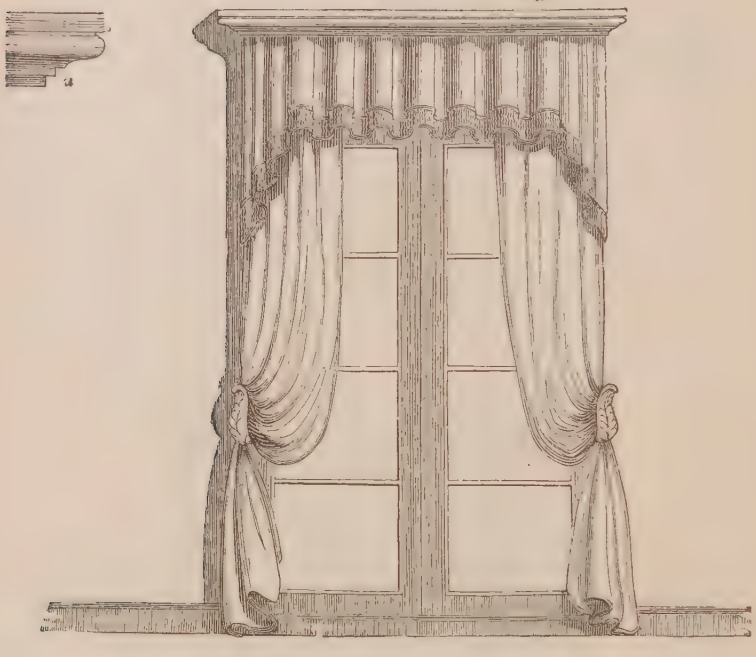

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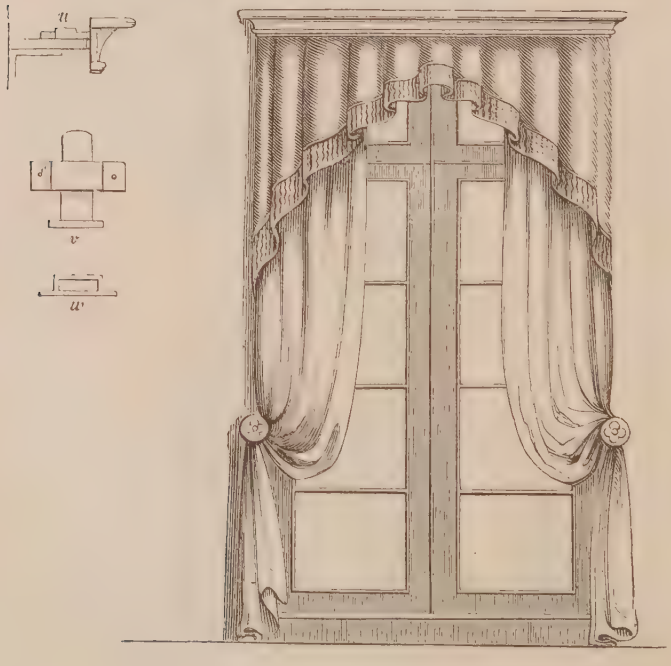

be fixed to the under side, or soffit, of the window, by hooks of the form shown at *q*. This is the very simplest form of curtain made to draw apart, and it may be made by any country carpenter. The cheapest material for these curtains is calico, dyed crimson, blue, or any other ingrain colour that will wash. They may also be formed of dimity, with a strip of glazed calico about an inch and a half wide, of any colour suitable to the other furniture of the room, sewed on about two inches from the margin. This coloured calico is, of course, taken off when the dimity is washed, and, with care, will last clean and look well for years. Coloured calico cut in vandykes, or in any other pattern, and sewed on close to the edge, may be substituted for the plain strip, if preferred.

670. *Window Curtains in the Grecian style.* Fig. 708, p. 339, may be considered as suitable for a cottage finished in the Grecian style, including under that term the Italian manner. This curtain requires a different bracket from the other. A lath, four inches wide, fig. 709, *r*, is fixed on the architrave of the window, by an iron angle bracket, *s*. The bracket which supports the pole, *t*, is of brass, and it is fastened by screws on the top of the lath. The curtains are arranged as in the preceding Design, and the drapery or valance over them, at top, is hooked into the rings (shown in fig. 708), in a similar manner to the curtains, so that both drapery and curtains may be taken off to be washed. The pole to which the drapery is attached would look remarkably well if stained of a mahogany colour; or, in a Gothic cottage, to resemble oak. Fig. 710, p. 340, is another curtain in the Grecian style, in the construction of which the plaited drapery, or valance, is tacked to the cornice in a manner which we shall include in our description of the next figure.

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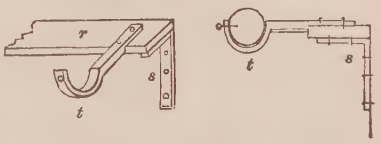


671. *A Gothic Curtain and Cornice* are represented in the Design, fig. 711, p. 340. The cornice may be made of deal, and painted and grained to imitate oak. The drapery is nailed on to the lath with tacks, the heads of which are covered by the cornice, as shown in the sections, p. 340, *u*. The cornice takes off and puts on by means of what are called cornice slides, *v*, which go into a broad staple, *w*. The curtain runs behind the drapery, on a pulley rod, as shown in the section *x*, in fig. 708, p. 339. The pins to support the curtains may be made of oak, in order to harmonise with the cornice.

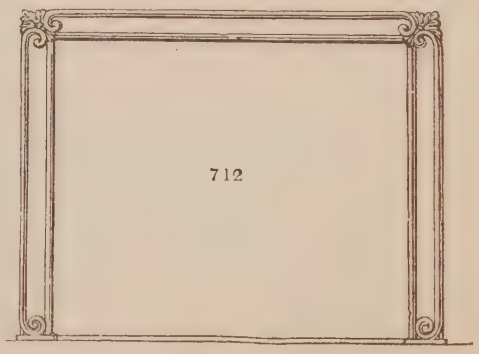
672. *Curtains for the humblest description of Cottages.* Where an apparatus of lines and pulleys would be too expensive, a simple curtain, opening in the centre, may be formed by nailing two pieces of dimity, coloured calico, or printed cotton, to a square cornice, either painted, or covered with a piece of paper bordering; these curtains may be looped back by a piece of sash line, or coloured cord, twisted round hooks fixed to the architrave, and will thus form a kind of Gothic drapery across the window. Another simple description of curtain is formed by nailing a piece of dimity, or other material, of the requisite length and width, to a flat piece of wood, in one end of which are inserted two pulleys; while two others are let into it, one in the middle, and the other at the opposite extremity. Three pieces of tape are sewed down the curtain, one on each side, and one in the middle, to which are affixed small rings, at regular distances: through these rings are passed three pieces of cord, which afterwards go over the pulleys, and, being fastened together on one side, are kept tight by means of a pulley rack. By this apparatus the curtain may be raised or lowered at pleasure. The board with the pulleys is concealed by a cornice, to which a valance, or any other description of drapery, may be attached.

673. *Inside Window Blinds* are of various kinds; but the chief are roller blinds, Venetian blinds, and wire blinds. The roller blind, being much the cheapest, may be considered the most suitable for common cottages. It is simply a piece of linen, of the height and breadth of the window, nailed to a roller, which has a pulley at one end, by means of a string over which the blind is pulled up; and it is drawn down by a cord and tassel fixed to the middle of its lower edge. The blind is kept extended to the width of the window by a lath, passed through a broad hem, at the opposite end to that which is fixed to the roller. The roller works in pivots at each end; and motion is usually communicated to it, for the purpose of drawing up the blind, by an endless cord, which passes over the wooden pulley on the end of the roller, and under the small brass pulley in the rack. (A rack is shown in fig. 707, at *i*.) As the pulley and rack often require adjusting, a more simple plan is to have the pulley affixed to the roller of the blind, with a cylinder or axis smaller in diameter than that of the roller on which the blind is wound up. To this is attached a line, the length of which should bear the same relation to that of the blind, as the diameter of the cylinder of the pulley does to that of the cylinder of the roller. The line must be affixed when the blind is wound up on the roller, so that the action of drawing down the blind may wind up the cord.

The smaller the diameter of the axis of the pulley is in comparison with that of the roller, the shorter will be the length of string required. A great improvement in this description of blinds has been made by forming the roller of a tin case that encloses a spring, which acts so as to turn the roller, and pull up the blind of itself. The best description of this spring roller blind is one improved by Messrs. Barron and Mills, which we shall describe when treating of blinds for villas. Sometimes, instead of linen blinds being plain, they are painted with transparent colours, so as to represent stained glass windows, landscapes, &c. These blinds, while they exclude the sun, admit abundance of light, and are very suitable for staircase windows, or the windows of cottages which have either no view, or one which it is desirable to exclude. A great improvement has lately been made in the manufacture of transparent blinds by Mr. Newbury of London, who paints them on a superior description of gauze, of his own invention. Long and short Venetian blinds, and short inside wire blinds, are not unsuitable for the better description of cottages; but we shall defer what we have to say of them till we come to speak of Villa Furniture.

674. *Commoner descriptions of Short Inside Blinds* are formed of muslin or leno, either flounced all round, and opening in the middle, or with flounces only at top. These blinds may be affixed to the windows either by a piece of tape drawn through a string case running across the blind near the top, and fastened by brass hooks to the side styles of the window; or by brass wires or rods passed through broad hems at the top and bottom of the blind, and having a loop at each end, to drop on the pin of a small brass bracket affixed to the side style or bead of the window frame. Other blinds may be netted by the cottager's wife, of white cotton, or green worsted, the size required, and hung on brass hooks fixed to the astragals and side styles of the window. Various other blinds may be formed of equally cheap materials, according to the taste and skill of the mistress of the cottage.

675. *Lines and Knobs for Curtains and Blinds, &c.* The description of line used should always be the plaited thread line, which, being of the same material throughout, is much stronger, and lasts four or five times as long as the common twined sash line, which in many cases is made of one material on the outside and another in the interior. This patent thread line, as it is called, is manufactured of all sizes, from that fit for a carriage window blind, to one thick enough for a ship's cable; and it should be used, not only in curtains and blinds, but in hanging sashes, pictures, and, in short, in all cases requiring lines. Knobs of iron, brass, or wood, for the purpose of fastening lines round, are far preferable to the hooks of different kinds in common use; because they have a more solid and architectural look; are more removed from a common nail; and are not so apt to catch the corners of the laths of Venetian blinds, or to tear cloth blinds or curtains.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676. *Looking-glasses* for cottages may be divided into two classes; chimney or pier glasses, and dressing-glasses. Fig. 712 is a Design for a chimney glass in the Grecian style, and fig. 713 is another in the Gothic manner. The frames may be of deal, painted in imitation of oak, or they may be gilt, which is generally considered to look best. For a Gothic cottage, very handsome and cheap pier and chimney glasses may be formed by constructing a frame like a Gothic window, and glazing it with panes of plate glass, or of a superior descrip-

713

tion of common glass prepared as looking-glass. The same may be done in Grecian cottages by imitating a Grecian window. By placing mirrors of this kind so as to reflect the best exterior views, apparent extent, variety, and gaiety may sometimes be added to even small rooms. Where it is desired to have richly ornamented frames, they can be had in great variety, and at a very moderate price, made of the papier maché of Bielefield and Haselden (see § 568), or of a composition manufactured by Jackson of Rathbone Place.

677. *Dressing-glasses* may have their frames made either in the Grecian or Gothic style. Fig. 715 is the ordinary form, improved in the style of design, so as to harmonise with Grecian forms; and, if the supporters were of cast-iron bronzed, it might be recommended: but, made of wood, it is not heavy enough to resist the action of the wind against the back of the glass when the window is open; and, accordingly, bed-room glasses of this description are very frequently blown down and broken. Fig. 714 is

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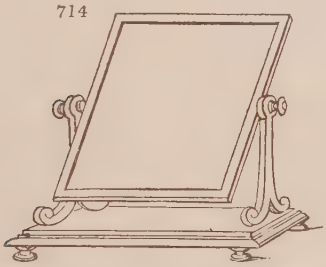

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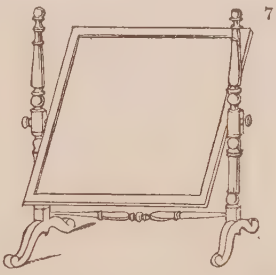

also a Design in the Grecian style, with a plinth or base of solid wood, on which it stands Such glasses are called by cabinet-makers plateau glasses; and they are far preferable to the common sort, for obvious reasons. Figs. 716 and 717 are Designs for plateau glasses in the Gothic style, which are given principally to show that style should be attended to in minor as well as in major articles of furniture. Fig. 717 has a drawer for trinkets, &c.

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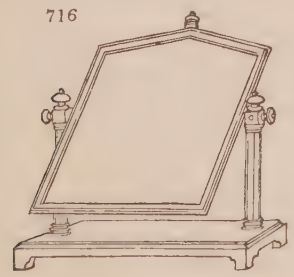

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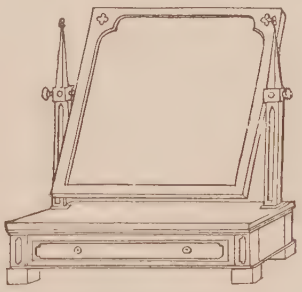

678. *Fenders* should be low, and may be narrow, when the fuel chamber is placed low; and more especially when the beveled front bars and drawer, § 599, fig. 534, are used. The lower and narrower the fender, the more heat, other circumstances being the same, will be radiated into the room. The front of the fender, unless very low indeed, ought always to be of open work, in order to admit through it the radiation from the fire. The forms and lines and general style of the fender ought to be the same as those of the grate; and both ought to harmonise with the chimney-piece. We have seen a cottage fender with a well hole inside for containing coals; thus serving instead of a coal scuttle, and at the same time drying the fuel so as to diminish the quantity of smoke produced; in this case the fender and its well fitted into a sunk panel in the hearth, and as it was in the house of a toll bar keeper, who had to sit up all night, it proved convenient; because the coals were always at hand, and burned readily when put on the fire. Fenders should have stands for fire-irons, unless a substitute is provided by holders being screwed to the grate. The cheapest kind of cottage fenders are of painted wire, and these may do for parlours and bed-rooms; but there are very handsome and cheap fenders of cast iron, which are much more appropriate for kitchens.

679. *Fire-irons*, stoves, and grates, when of polished iron or steel, require a great deal

of severe and disagreeable labour from women, which we have long wished to see put an end to, by the substitution of a more rational mode of heating than that of open fire-places; but, in the mean time, as the cottager must have fire-irons of some sort, we recommend him to have plain patterns, and rather to indulge in some other description of furniture which requires less care in keeping. Where wood is the principal fuel, we recommend the kitchen poker to terminate at the lower extremity in two claws like a claw hammer, or a crowbar; and to be hollow, with one orifice between the claws, and another at the opposite end for applying the mouth to blow the fire, or rather to rouse the embers after they have been collected together from the ashes by the claws. We have seen the use of such pokers in the kitchens of inns in Germany; and think they may be safely recommended as very superior to those in common use, where wood is burnt on a hearth.

680. *Carpets* are sources of comfort in every room; and we should wish the cottager to have not only one in his parlour, but, if possible, also one in his bed-room. For neither the parlour nor the bed-room would we recommend the carpet to be fitted to the room; because such carpets can very seldom be either turned or changed in any way. In general, whatever may be the shape of the room, the carpet ought to be in the form of a square, a parallelogram, or a circle. A square carpet may be changed eight times, so as to be worn equally on every part of both sides; a circular one, indefinitely. A parallelogram may be changed four times, which will also admit of wearing it with tolerable regularity. A carpet, accurately fitted, or planned (the term among upholsterers), to every projection and recess of a room, cannot even be changed once, unless the projections and recesses should be of a particular description of symmetry, which is very seldom to be met with. It is evident, then, that a fitted carpet, which can neither be changed nor turned, will not last more than one eighth the time of a square one, or one fourth the time of a parallelogram. For a cottager's bed-room, we would chiefly recommend one piece of carpeting placed by the dressing-table, and pieces neatly fitted to each other to go round the foot and sides of the bed. In general, the parlour carpet will require to be made fast at the margins with a few tacks, but the bed-room carpets may be left loose. Stair carpets give an air of great comfort and finish to a house; and a cottage should never be without one. We shall describe the manner of laying these down, and shall enter into other particulars respecting carpets, when we come to speak of Villa Furniture. When a parlour carpet does not cover the whole of the floor, there are various ways of disposing of the margin between it and the wall. Some recommend oil-cloth, others baize, drugget, coarse broadcloth, or brown linen; for our part, we greatly prefer to any of these, painting that part of the boards of the floor which is not covered with the carpet, of the same colour as the woodwork of the room; taking care that the margin painted shall exceed in breadth by a few inches the space which it is intended to leave uncovered. This is by far the best mode in staircases and in bed-rooms, as well as in parlours; it also saves a great deal of the most disagreeable part of a woman's household labours. When the woodwork of the room is painted to imitate oak, this mode of treating the margins of the floor has a particularly good effect. The expense may be objected to; but we shall show, when we come to treat of the art of house-painting, how easily any cottager or his wife, though they never before saw a paint brush in their lives, may learn in an hour to grain the woodwork of their cottage, in imitation of oak, sufficiently well for every purpose they can require. Round carpets are not very common in England, but they are not unfrequent on the Continent, and look exceedingly well in a square room.

681. *The kinds of carpets most suitable for cottages* are chiefly the Scotch and the Kidderminster, on account of their cheapness; but we consider none too good for the cottager, provided he can afford to pay for them. In choosing a pattern, the smallest is generally to be preferred, not only as a matter of taste, as being more in accordance with small rooms, but in point of economy; because, in sewing the breadths together, it requires less cutting out to make it match, and because, when the carpet gets old, the patches put on in mending are less conspicuous. The parlour carpet, and the carpets of at least one bed-room, should be of the same pattern, in order that, when the former is partly worn out, the latter may be used to mend it; because it is always bad, both in point of effect and economy, to mend what is old with what is quite new. A very neat pattern for carpets has lately been introduced for libraries, but it would suit Gothic cottages equally well. It consists of an imitation of wainscot, has a quiet subdued tone of colour, and accords well with furniture made, or painted in imitation, of oak.

682. *Colours of Carpets.* Much of the opinion which we form of all objects depends on the effect of the first impressions which we receive from them. Our first ideas of any man or woman, on seeing them at a short distance from us, are taken from their height and clothing; and our first ideas of a room, from its size, and the covering or colour of its floor and walls. Taking the room as a whole, and considering its effect as

a picture, the colours of the carpet and of the walls will form the principal masses in the composition, and will necessarily influence every other component part. If the floor and the walls were of the same colour, there would be a deficiency of force and of effect, from want of contrast; if they were of different colours, equally attracting the eye, the effect produced would not be that of a whole; because a whole is the result of the cooperation of different subordinate parts with one principal part. The harmony of the colouring of a room, therefore, can only be produced by the same kind of knowledge which guides an artist in painting a picture. The principles of the art of painting supply the principles for the art of distributing colours in furnishing; but, as this art cannot all at once be communicated to the reader, all that we shall attempt, at present, is, to supply him with a few hints, drawn from the usual practice of upholsterers. These are, that neither the colours of the carpet should be so brilliant as to destroy the effect of those of the paper, nor the contrary; and that the curtains should always be of a colour suitable to both. It is not necessary that they should be of the same colour, but that they should be of colours that harmonise, or, in other words, look well together. A very brilliant colour, such as crimson, in the carpet, may have a drab or other subdued colour in the curtains and paper; but then there should be some of the brilliant colour introduced in both, as bordering or ornaments. Thus, a room with a bright blue or crimson carpet may have white, yellow, or drab, curtains and paper; but blue or crimson bordering or ornaments should be introduced in them, to harmonise the effect. It would not do, in the case of the blue carpet, to have green curtains or paper, or with the crimson to have scarlet; because these colours do not accord. A green carpet may have black, red, or white curtains, with green borders and ornaments. A yellow carpet may have black curtains, and a dark grey paper with yellow borders and ornaments. Whatever will apply to a self-coloured carpet, curtains, or paper, will apply equally well in all cases where those colours predominate. It should never be forgotten, that the whole effect of an elegantly furnished room may be destroyed by the selection of a carpet which, though handsome in itself, does not harmonise with the other furniture.

683. *Geographical Carpets.* The idea of a geographical carpet, that is, a carpet with the lines of a map substituted for a regular pattern, has been suggested (*Mech. Mag.*, vol. xii. p. 21.); and we agree with the author of the suggestion in thinking that "a carpet is so admirably adapted to geographical instruction, that it may be almost said to be a natural article for the purpose. A map is a picture of the surface of the earth, and on the ground is the place to view it. One on so large a scale as a carpet would admit, is calculated to give a more correct idea of the relative position of places than could be effected by the largest map now extant. A family in the daily occupation of a room furnished with such a carpet, would acquire unavoidably a more permanent knowledge of a given portion of the earth than could be obtained by any other means; and, when the local position of the room would admit, the carpet might be placed agreeably to the bearings of the compass, and it would thereby give a correct idea of the real direction of places on the map." The principal objection to this plan seems to be, the great difficulty which would attend its execution. A map, such as above described, might, however, be printed on fine cloth, or brown holland linen, and might then serve as a cover to a carpet. This would be particularly suitable for a school-room or nursery.

684. *Substitutes for Carpets.* Green baize and drugget are often used as substitutes for carpets, and are not only cheap, but in many cases look remarkably well. When a drab drugget is used, a border of black or any dark-coloured cloth, laid on about two inches from the margin, has a very good effect. Cheap carpets may be made by industrious housewives of a kind of patchwork. Remnants of cloth bought from the woollen-draper, or tailor, and cut into any kind of geometrical shapes, may be sewed together, so as to form circles, stars, or any other regular figures that may be desired; and, when arranged with taste, produce a very handsome and durable carpet, at a very trifling expense. The figures, of whatever nature they may be, should be always symmetrical; and a handsome border should invariably surround the whole, so as to preserve the idea of unity of design; care should also be taken that the colours employed harmonise, not only with each other, but, as before advised, with those of the other furniture of the room.

685. *Paper Carpets* are formed by cutting out and sewing together pieces of linen, cotton, Scotch gauze, canvass, or any similar material, &c., to the size and form required; then stretching the prepared cloth on the floor of a large room, and carefully pasting it round the margins so as to keep it strained tight. If cotton be the material, it will require to be previously wetted. When the cloth thus fixed is dry, lay on it two or more coats of strong paper, breaking joint, and finish with coloured or hanging paper, according to fancy. Centre or corner pieces, cut out of remnants of papers, which may be bought for a mere trifle, may be laid on a self-coloured ground, and the whole surrounded by a border; or any other method adopted which may suit the taste or circumstances of the

occupier, or accord with the other furniture of the room. When the carpet is thus prepared, and quite dry, it should receive two coats of glue, or size made from the shreds of skins, such as is used by carvers and gilders. This size should be put on as warm as possible, and care should be taken that no part of the carpet be left untouched by it; otherwise the varnish to be afterwards laid on will sink into the paper, and spoil it. When the size is perfectly dry, the carpet should have one or more coats of boiled oil; and when that is dry, a coat of copal or any other varnish. The varnish is not absolutely essential, as boiled oil has been found to answer very well without it; but where oil only is used, it requires several more coats to be applied, and takes a much longer time to dry. These carpets are portable, and will roll up with about the same ease as oilcloth. They are very durable, are easily cleaned; and, if made of well-chosen patterns, have a very handsome appearance. Where labour is cheap, the cost will be very trifling; the materials being of little value, and the expense consisting chiefly in the time requisite to put them together. Where cloth cannot be easily procured, the carpet may be made by pasting paper to painted boards; when, by repeated coats of paper, it is become strong and firm, it will separate from the paint, and will be as durable as if mounted on any kind of cloth. For earth, brick, or stone floors, in order to render them impervious to damp, these carpets may be made with two faces, by pasting paper to both sides of the cloth which forms their basis, and well oiling or varnishing them on the under as well as upper surface: they may also be bound with leather or any strong substance, to prevent moisture from penetrating to the paste. The paste used in the preparation of these carpets ought to be very strong, and is best when beer or sweet wort is substituted for common water. It must be kept free from lumps, and, when taken from the fire, stirred till cold. Papers used for carpets should have sufficient gum or size employed in the printing of them, to enable them to withstand the effects of the washing over with warm size. If printed in oil, a strong coat of size should be given to the back to prevent the oil from penetrating through the paper, otherwise it cannot be pasted to linen, cotton, or any thing else. Papers printed in oil will not require any size before they receive the finishing coats of boiled oil and varnish. When varnished on one side only, they ought to be rolled up with that side outwards, to prevent its cracking. (*London Jour. of Arts and Sciences.*) Paper carpets would perhaps be better for geographical subjects, than carpets formed of any material produced by the loom. We have before suggested the idea of geographical, natural history, and other scientific papers, for the walls of apartments; and, if these were once made, they might be transferred to paper carpets at pleasure.

686. *Hearth Rugs* are of various patterns and prices. Their use is obvious, in saving the carpets from becoming worn by the constant movement of persons near the fire. When economy is an object, a piece of carpeting the same as that of the room, and the width of the hearth, may be employed, and this may be either hemmed at the ends, or surrounded by a deep fringe of black or very dark brown worsted, which the mistress of the cottage may net herself, and sew on. A cheap rug may also be formed of a piece of drab drugget bound with black, or any other colour to suit the paper and curtains, and fringed; either with or without a strip of cloth, of the same colour as the binding, laid on about two inches from the margin. This kind of rug does very well without the fringe. Another kind of cheap hearth rug may be made by the cottager's wife, of remnants of cloth cut into narrow strips about half an inch broad, and three or four inches long; these strips are doubled, and sewed at the bend, in rows, to a strong piece of cloth, or knitted into a framework of packthread. In either case the colours are disposed so as to form some kind of pattern; and, the ends being left loose, and cut even when the work is finished, with a large pair of scissors or shears, the whole presents a remarkably rich, warm, and massive appearance.

687. *Painted Floorcloths* may sometimes be used in the lobbies and passages of cottages; but they are not economical articles, where there is much going out and coming in of persons generally employed in the open air, and of course wearing strong shoes, probably with nails in the soles. When they are used in cottages, the most appropriate patterns are imitations of some materials usually employed for floors, such as tessellated pavement, different-coloured stones, wainscot, &c.; but, for the better description of dwellings, where oilcloths are considered chiefly as ornamental coverings, there seems to be no reason why their patterns should not be as various as those of carpets.

688. *Matting of different sorts* may be extensively used in cottages. There are some kinds, which the cottager might make for himself in the winter's evening; and there are others that he may purchase cheap. Matting is manufactured, in many different manners, out of the straw of corn, rushes, or other long, narrow, grassy or sedgy leaves. Among the uses to which a cottager might apply mats of this sort, which he could make himself, are, seats for chairs, stools, and benches; foot mats for outside doors; and screens, than which there is not a more useful article for the cottage kitchen. In Monmouthshire,

easy chairs with hoods, like porter's chairs in gentlemen's halls, are constructed of straw matting on a frame of wooden rods, or of stout iron wire; and chairs like fig. 718 are made entirely of straw in different parts of England, in the same way as the common beehives. Matting of this sort might in some cases be employed as partitions, and is extensively used in the more miserable of the cottages both in France and Scotland. Russian matting, or bast, made from the inner bark of the lime tree, is very cheap, and might be useful to the cottager in many ways: the walls and partitions might be lined with it, and temporary ceilings formed of it in hovels where there were none. There are various other applications of Russian matting, which will readily occur. Indian matting, when bound with black or coloured ferreting, is a very neat article, and may be used either for walls or floors.

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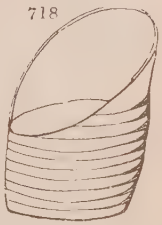

689. *Door Mats* may be made of basketwork, straw, rope, hair, wool, sheepskin, &c. A very good outside mat, or rather perhaps scraper, is formed by a piece of flat wickerwork, somewhat coarser than that of a common hamper; it takes the dirt effectually from the soles of the shoes, and as it falls down in the interstices between the rods, the wickerwork has only to be lifted up now and then, and the dirt swept away. A mat which operates like this wicker mat has been formed in Germany of flat tarred rope, in the following manner: — The breadth of the rope, fig. 719 *a*, full size, is about three quarters of an inch, and it is something more than a quarter of an inch thick. The outline of the mat is first formed by setting the rope on edge on the floor, or on a piece of board, in the manner of a frame, and attaching it in two or three places with nails or pegs; the rope is next returned on itself in zigzag lines within the frame, either by continually going round it till it ends in the centre, or by going backwards and forwards from one end to the other, till it finishes on one side. This being done, all the parts which touch are sewed together, and the result is a mat like fig. 719, *b* (to the scale of half an inch to a foot). These mats are imported from Germany; and, when used as shop-door mats in London, they are found to be more durable than any other kind that has yet been tried. One of the commonest and most useful out-door mats is made of untwisted rope yarn, woven into very coarse canvass, and then cut, so as to present a brush-like surface, on which, not only the soles of the shoes may be cleaned, as in the wicker and rope mats, but also the sides. In-door mats are made of hair, tow, or wool, in various modes. One of the best for a cottager's bed-room door is a black or grey sheepskin, with all the wool on. A black or dark goatskin makes also a very handsome mat. Skins with white or other light-coloured hair or wool make very handsome mats, but are hardly advisable for a cottager, as they require frequent washing.

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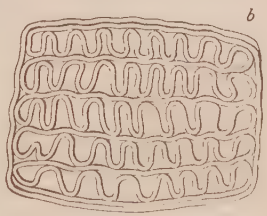

690. *Scrapers* for the feet may be let into the wall of the cottage, on each side of the door, a cavity being left over the scraper for the foot, and one under it for the dirt. There are various forms of scrapers for building into walls, which may be had of every ironmonger; and all that the cottager has to do is to choose one analogous to the style of his house. There are detached scrapers in endless variety; the most complete are those which have brushes fixed on edge, on each side of the scraper, which, with other forms, we shall describe and figure under Villa Furniture. Scrapers are so essential to cleanliness, that, where the cottager can get no better, he may drive two short stakes into the ground, about a foot apart and half a foot high, and let into them a piece of iron hooping edgewise; or he may sink the blade of an old spade, with its edge upwards The last two scrapers are very suitable for gardens; and, unless the cottager keep his garden walks perfectly clean, or at least free from the clods of earth which will stick to his feet when working in the compartments, he cannot expect to have the gravel of his platform in nice order, or his entrance-porch clean. A dirty entrance is a sure sample of an untidy housewife; and little comfort can be expected in a cottage the floor of which is soiled with filth brought into it from without. Those cottagers who can afford it may purchase the portable scraper, fig. 720, which costs, in London, only 1*s.* 6*d.*, or fig. 721, which costs 2*s.*; both of which will answer either for the entrance door or the garden walks: or they may take the dibber scraper, fig. 722, which costs only 2*s.* 6*d.*, and may be stuck into the garden anywhere, and pulled out again to remove it, at pleasure.

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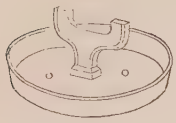

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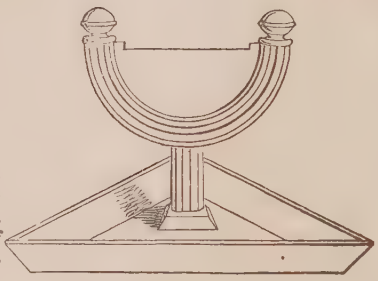

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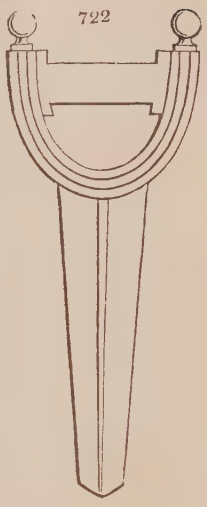

An excellent scraper, partaking of the nature of a mat, may be formed by letting a number of pieces of iron hooping edgewise into a wooden frame, say a foot or more wide, and eighteen inches long. The pieces of hooping may be from an inch to an inch and a half apart. Wooden hooping, or straight-edged laths, may be substituted for iron; but the latter is more effective, as well as more durable. Scrapers of this sort may be let into a stone, so as to be level with the adjoining path or pavement; but in this case there should be a pit, three or four inches deep, beneath the scraper, and the latter should admit of being taken out, to remove the dirt from the pit. In Holland a very good cottage-garden scraper, particularly for sandy soils, is formed by fixing small iron bars, or pieces of hooping, in the circumference of two segments of ovals, fig. 723; the chord of the segment is about nine inches in length, and the width of the scraper a foot. When it is used, the sand, or other dirt, drops from the soles of the shoes, between the bars; and, when the space is filled, the scraper is lifted up, and the dirt removed.

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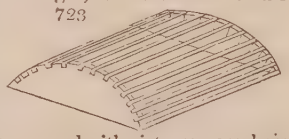
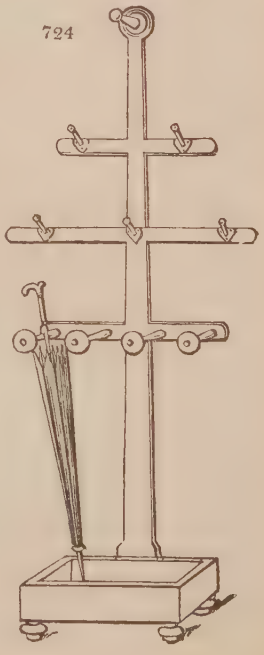


691. *Hat and Umbrella Stands.* Both these articles combined, as in fig. 724, may form a suitable piece of furniture for a Gothic porch or passage, where the walls are covered with pictures; or where there are other objections to having coat and cloak pins fixed against them. Besides, it is always better for hats to be hung on stands in the free air of the apartment, than to have them placed on a table, or against a wall, where they get the air only on one side. In the box at the bottom of this stand, there is a tray of tinned iron, painted black, which lifts out, in order that it may be emptied of the water which may run into it from wet umbrellas, &c., and be cleaned. Where there is sufficient space in the apartment, hat and cloak pins may be put on both sides of the tree; in which case there should be a second box. We have shown on the two upper branches or rails of the trunk, or upright piece, five hat pins, or surplice pins, as they are called by upholsterers, which may be made either of brass, or of iron bronzed. On the lower rail there are four wooden pins, which may be either made of oak, or painted in imitation of it. These pins are formed in two pieces; the stem, or shank, and the head; and the latter is screwed into the former, as indicated in fig. 725. Such

724



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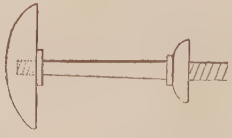

pins are made of mahogany, in Birmingham, in large quantities, and are sold to the trade all over the country. They are far superior to brass or iron knobs or pins; because they never tarnish or rust, and because they give decided evidence of improved design, in their far removal

from the common nail or hook. The umbrella stand, fig. 726, might very well be made of cast iron; and could not, in that material, cost more than a fourth of what it would

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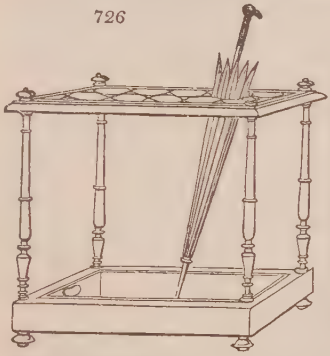

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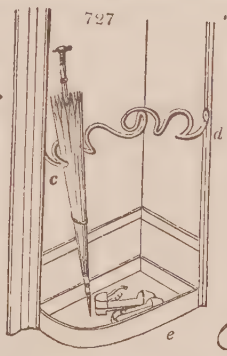

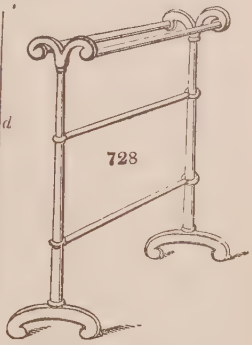

in any description of wood; but in this, and in similar cases, the objection is, the first expense of the pattern, which, being necessarily considerable, cannot be prudently incurred, unless the manufacturer be secure of an extensive sale. We could wish that our furnishing ironmongers would direct a portion of that power of invention which seems to be now almost exclusively occupied in contriving bad fireplaces, to the improving of the designs and lowering the price of cabinet furniture, by the judicious introduction of cast iron. Much, we are sure, will one day be done in this way. For a small cottage, a very useful corner umbrella stand, may be formed by bending a piece of stout brass, or iron wire, somewhat in the form of *c d* in fig. 727, and fixing it in the angle of the porch, immediately within the outside door; placing below a corner tray of tinned or cast iron, *e*, to receive the water from the wet umbrellas. The use of the wire is to prevent the wet umbrellas from touching the wall, and the use of the bends in it is to keep the umbrellas or walking-sticks apart.

729

730

692. *A Towel Horse* has generally one rail at top; but a double rail, as in fig. 728, is a great improvement; for, when a wet towel is thrown across both rails, the air has freer access to it, and it dries much sooner. It may be formed of deal, and should at all events be painted, for the reasons given when speaking of fixed towel rails, § 610.

693. *Clock-cases* for cottages may be harmonised both with the style of the building and that of the other furniture, by the lines of their mouldings and the forms of their panels. Figs. 729 and 730 are examples; the former in the Gothic, and the latter in the Grecian style.

694. *A Folding Screen*, for keeping off the wind, is required in most cottage kitchens, particularly such as have no porch or lobby. The most suitable, where there is room, is the settle, § 636, especially with the addition of Mallet's iron castors; but very light and efficient screens may be formed by two or more wooden frames, five feet high, and two feet wide, hinged with girth webbing or leather, so as to fold either way. The mode of hinging, so as to admit of this, is by nailing the pieces of girth which serve as hinges, alternately to one side of

the one hanging style, as at *a*, fig. 731, and to the opposite side of the other, as at *b*. Supposing two hinges done in this way, the two alternate ones should be nailed, as indicated by the dotted lines at *c* and *d*. A brass hinge, to answer the same purpose, has been lately invented by Mr. Vokins, architect and builder, of Wilton Road, London; several of whose ingenious inventions and contrivances we shall have to notice when speaking of Villas. The wooden frames for the screen may have canvass strained on them, in order that they may be covered with paper; or they may be covered with green baize, drugget, or any similar material, with a border of ferreting, attached by brass-headed nails, or bordered by the nails only. In case of the screen being covered with paper, maps, subjects of natural history, arithmetical or chronological tables, almanacks, or, in short, any kind of useful subjects, should be preferred, for the reasons given, § 584.

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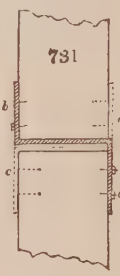

695. *Fire-screens* may be wanted in a cottage as well as in a palace. A lady has sent us a cottage fire-screen, made of straw, with a hook attached to it, by which it is hung on the back of a chair, fig. 732, which will answer very well when sitting with the back to the fire. To shield the face a standard fire-screen is required; but we shall leave the reader to contrive one for himself from the Designs, which he will find in another part of this work, under the head of Fire-screens for Villas.

696. *Clothes Horses and Stands for brushing Coats.* Clothes horses, for drying linen, &c., are open frames hinged in the same manner as folding-screens; and one or more of them should be found in every cottage, not connected with a public drying establishment. There are generally three horizontal rails to these clothes horses; one at top, one within two feet of the bottom, and one between. In a small cottage the clothes horse might be contrived to answer the purpose of a screen, by having a movable cover, either to slip on, or to be attached by hooks, or pieces of tape. Stands for brushing clothes are formed of a foot in the form of a Greek cross, with an upright piece firmly mortised into it at the point of intersection; into the top of which, about five feet from the ground, is mortised another piece, about two feet long, which serves as arms, on which is put the coat to be brushed. Where there is not room for a stand, the arms, with a post of six or eight inches in length, may be hinged to the back of a door, so as to fall down like a flap when not in use, and be supported by a bracket, or horse and rack, when a coat is to be brushed; or the form shown in fig. 733 may be adopted,

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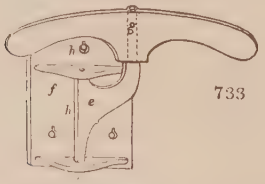
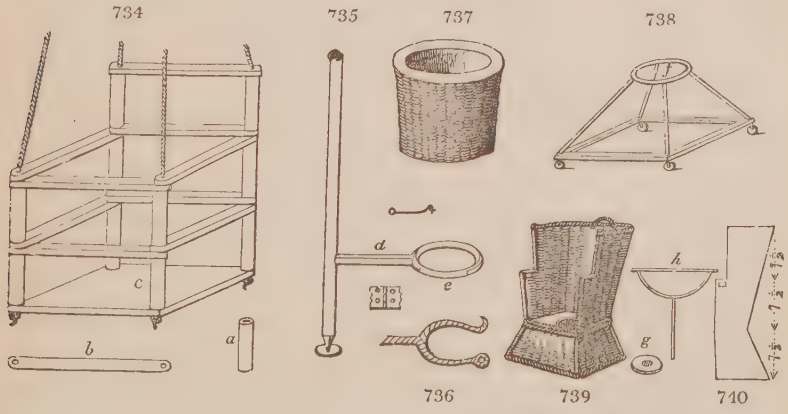


733

in which the jib bracket, *e*, works by two pins in *f f*, and the cross piece, *g*, also works on a pin in the upper part of the bracket; the holes, *h h*, are for slipping it on to nails fixed to any wall or door. Whatever kind of coat stand or horse may be used, there should always be a table at the command of the person brushing the coat, on which to fold it up, previously to putting it away.

697. *Children's Furniture.* To enable a mother who has no servants, to relieve herself at pleasure from carrying her child, there are various contrivances in use in England, which deserve to be mentioned; and there is one, for cleanliness and decency, which deserves imitation in every country, and more especially in our own. Fig. 734 is a swing chair, formed out of ten pieces of elder tree, *a*, six inches long, and an inch and

a half in diameter, with the pith burnt out with a redhot poker, or other iron; nine rails about a foot long, with a round hole at each extremity, *b*; a bottom board a foot square, with a round hole in each corner, *c*; and four sash lines or cords about a quarter of an inch in diameter, and of sufficient length to reach from the ceiling of the room in which the chair is to be hung. Knots being made on the ends of the lines, the tubes and rails are strung on as in the figure, and the other ends of the cords tied together and suspended from a hook in the ceiling. By omitting four of the cylinders and four of the rails, a chair may be made for an infant of the earliest age. A cushion may be put in the bottom, or the bottom may be stuffed. Fig. 735 is a go-gin for a child who can stand, to teach him to walk. It consists of a perpendicular shaft, long enough to reach from the floor to the ceiling, which turns in a hole in a brick or stone of the floor, and within a staple driven into the side of one of the ceiling joists, or by any similar means. The piece *d*, about eighteen inches long, is mortised into the upright shaft, about eighteen inches from the ground; and the wooden ring, *e*, about seven or eight inches in diameter, has a piece about six inches long, which is hinged at one end, and fastened with a hook and eye at the other. This opens, and the child being put in is enclosed at the height of the waist. The ring taking part of the child's weight, he cannot fall, and he soon learns to walk. Frequently this ring is made of twisted withy, fig. 736, with an eye at one extremity and a hook at the other: or each extremity is made to terminate in a loop, and when the child is put into the ring one of these is slipped over the other, and a hooked wooden pin serves to keep them together: in both cases the hinge is made like that of the handle of a basket. Both these pieces of furniture are made in England by every cottager for himself. Fig 737 is a hollow cylinder, nothing more than the section of the trunk of an old pollard tree, commonly to be met with in England; the inside and upper edge are smoothed, and a child just able to stand is put into it, while its mother is at work by its side, or going after the business of the house. Fig. 738 is a go-cart which is frequently made of willow rods without castors, but is here shown as a piece of carpentry, standing on castors. The ring, *f*, opens with a hinge, and shuts, and is made fast like *e* in fig. 735. Children readily learn to walk by these machines, without the danger of falling. Fig. 739 is a pierced chair, made entirely of wickerwork, which costs, complete, about London, only 4*s.* 6*d.*, while there is a cheaper sort, with a rush bottom, at 2*s.* 6*d.* Every one who can make a basket can make a chair of this description. First form the skeleton frame, fig. 740; then commence round the circular hole in the centre, and work in either willow rods or rushes towards the extremities, according



to the kind of chair it may be wished to produce. The cover of the vase in the seat, *g*, is lifted off by two thumb holes, so as to be quite flat for the child to sit upon when the vase is not in use. There are two holes in the elbows of the chair, through which may be placed either simply a rod to keep the child from falling out, or a table flap, *h*, with two pins at the ends to fit into the holes; the table being also supported by a movable leg in front, and having a ledge round it for holding the child's playthings; its pins being kept in their holes by the elasticity of the sides of the chair. In England the cottager's child is placed on a chair of this sort after he is a week old; but in Scotland there is neither this chair, nor any substitute for it. In both countries there are small chairs with long feet, for elevating children to the height of an

ordinary table, so that they may sit and eat with their parents; and these, like the pierced chair, ought to be universally in use.

698. *Other articles of furniture* might be enumerated, and various hints given for the selection of household utensils and instruments, but we are doubtful whether in this work they would be seen by those who would feel most interest in them, or to whom they would be most useful. A washing and wringing machine, such as we shall figure in our next Book would be too dear for one cottager; but we would strongly recommend that half a dozen cottagers should join in purchasing one; as it would afford a great saving of labour, and that, too, of the most oppressive kind, to the cottager's wife; since wringing is, to a female, almost as great an exertion as mowing is to a man. Washing-tubs have hitherto been chiefly made round, and by the cooper, probably to accommodate the form to the ancient practice of washing by treading with the feet; but oblong troughs are much cheaper, and far more convenient. — Every house whatever ought to possess the means of filtering the water used in cookery. We have shown how this may be done on a large scale, § 31 and 305; on a small scale, the operation may be performed with a common garden flower-pot of a foot or more in height, according to the impurity of the water to be filtered. Over the hole in the bottom of this flower-pot should be placed a piece of sponge; around and over which should be put two or three pieces of smooth clean stones, to keep it in its place, and, at the same time, to prevent the pressure of the filtering materials (to be placed over them) from rendering the sponge so compact as not to allow of the escape of the water. Fill the pot, when thus prepared, to within two inches of the brim, with a mixture of one part of powdered charcoal, and two parts of clean sharp sand, and on the top of this lay a piece of flannel, letting it sink in the centre, but making it fast on the outside of the pot, by a string tied tightly under the rim. The upper surface of the pot will now form a shallow basin, lined with flannel, into which the water to be filtered is to be poured, and it will be found to come out rapidly at the bottom, quite clear. As the flannel will intercept the grosser impurities, it should be taken off frequently, and washed and replaced; and two or three times a year the sand and charcoal ought also to be taken out and washed. This will be found absolutely necessary; for the purification is effected simply by the filtering materials attracting the impurities in the water; the sand the earthy particles, and the charcoal those of organised matter. From this use of the charcoal the reader may learn to increase or lessen its proportion, according to the nature of the water to be purified. — When a cottager keeps a cow, he will require a churn, and one of the cheapest and best is the patent box churn which may now be had at Weir's manufactory, London, for £1. Butter may be made in this churn with a fourth of the labour requisite with the common plunge churn; it is, besides, much more easily used, and when not wanted as a churn, makes an excellent vessel for holding water. In the choice of utensils much depends upon knowing when to choose iron, and when wood, earthenware, or papier maché. Cast-iron pots, tea urns, tea and coffee pots, and parlour candlesticks, are excellent; but iron tea trays are bad, as compared with those of papier maché, because one of the latter will last out a dozen of the former. The same may be said of all vessels of copper or pewter, as compared with those of cast iron. It must never be forgotten that copper, pewter, and lead vessels sell for nearly as much by weight, when old and worn out, as when new, and that even cast iron will sell for something, but that vessels of wrought or turned iron, when worn out, are of no value at all. Spoons, forks, and other articles, made of a composition of nickel and other ingredients, and known under the name of German silver, or of Beauchamp's British plate, may be recommended as very good substitutes for real silver.

699. *Pictures, Sculptures, and other internal Ornaments.* There is no cottage or dwelling, however humble, in which there will not be found some object purely ornamental: we have observed this to be the case in the most wretched log-houses in Russia, where engravings of the rudest kinds, and sometimes fragments of glass or earthenware, such as no one would think worth picking up in the street in England, are placed in rooms which cannot boast of either chairs, tables, or beds. The occupants of these hovels sleep in their sheepskin clothes, on the stove in winter, and on the floor or out of doors in summer; and their seats and tables are wooden forms or turf benches. It seems, at first sight, difficult to account for a taste for ornament existing among people so circumstanced; but the truth is, that man, whether in a state of barbarism or refinement, is essentially the same animal, and ornaments his home, because he loves it, and wishes to render it agreeable. The trumpery of the Russian boor, and the pictures and statue of the English gentleman, are collected and displayed exactly on the same principle. It is clear, therefore, that every cottager must have ornaments in his house, as well as flowers in his garden; and, since whatever it is worth doing at all, it is worth doing well, we strongly recommend him to cover his walls with the best engravings he can get, and to ornament his chimney-pieces with handsome plaster or terra cotta casts. Such articles may now be had for a mere trifle; for example, alto relievo plaster portraits, on

tablets six inches or eight inches square, of eminent men, remarkably well cast, may be had in London by retail, at 6*d.* each; casts of Venus, Cupid, Adonis, and of various celebrated antique statues, eighteen inches or more high, may be had at 5*s.* each; busts of a large size may be had at the same price, and Swiss figures in terra cotta at 2*s.* 6*d.* each. By sizing over plaster casts when they are first bought, and quite clean; and afterwards, when the size is perfectly dry, washing them over with copal varnish, they may be made to look almost as beautiful as marble sculpture. (*Mech. Mag.*, vol. xiv. p. 96.) Excellent engravings of subjects of every description may now be had for a few halfpence each: the commoner sorts the cottager may paste on the back of his settle, fig. 636, § 636, or kitchen screen, and varnish them; and the better kinds he may frame with common deal, painted to imitate maple, and either glaze or varnish them according to his means. When there is a good broad chimney shelf, there will be room for other ornaments of a smaller description than busts or sculptures, such as curious stones, spars, ores, or other minerals, or coins, and objects of art and antiquity; and these the cottager will collect as he can. The public taste for articles of this description has improved in an astonishing degree within the last twenty years; and, as knowledge spreads, and the working classes acquire that leisure which, in consequence of this spread of knowledge, will become a necessary of life to even the most hard-working country labourer, this improvement will increase. But the objects with which, above all others, we should wish to see the cottage ornamented are books; and every room, even the kitchen and bed-room, ought to have its book shelf. If we were asked what sort of books we should recommend generally to the cottager, meaning in this term to include the very humblest class of society, as well as the more elevated, we should reply that, as our aim is to render him free and independent alike mentally as physically, to fit him in short for taking care of himself, we recommend, first and principally, works on morals and politics: the former, that he may know the principle on which the social duties of all individuals are founded; and the latter, that he may learn the use and duty of public government. Next, we recommend books on his own art, trade, and manner of living; and, for the rest, we leave him to his own taste. Every cottager ought to possess a general encyclopædia and to take in a newspaper. The penny magazines, and other cheap literature of the present day, though more calculated to amuse the cottager, than to instruct him how to improve his condition, will end in creating a demand for something better.

700. *Remarks.* Some other articles of furniture and decorations suitable for cottages might be enumerated; but we have, we think, done enough, in Designs both for cottages and furniture, to prove the assertion with which we set out (§ 14), that all that is essentially requisite for "health, comfort, and convenience, to even the most luxurious of mankind," may be obtained in a cottage, the walls of which are of mud, as well as in a palace with walls of marble; in a working man's college of one story, as well as in the magnificent halls of Oxford and Cambridge, or in the elegant club-houses of London. A number of our readers will, no doubt, object to many of our Designs, both of cottages and furniture, as being beyond the reach of the great majority of British cottagers; but let such recollect that, in our Introduction to the Book of which this is the conclusion (see § 13), we included under the term cottager, not only labourers, mechanics, and country tradesmen, but small farmers and cultivators of their own land; and the gardeners, bailiffs, land stewards, and other upper servants, on gentlemen's estates. Let them consider, also, that our plans and views extend to both hemispheres (see § 1); and that the citizen of America, who thinks with his countryman, Dr. Dwight, that all private dwellings should be as much as possible alike in accommodation, and that architectural display should be confined, as in ancient Greece, chiefly to public buildings, may on his part not only find the Designs given not too good, but may even object to our making any distinction between Cottages and Villas. The British cottager or workman is, no doubt, at present in a widely different situation from the American; but we anticipate for him a new era, and a condition very different from that in which he now is, at no great distance of time. All the evils which have so long afflicted him have arisen from his own moral and political ignorance, and from his consequent incapacity for self-government, either individually or collectively; and they will be dispelled by the education of the rising generation, and the new order of things which will thenceforth be established. The working classes will then be able to take care of themselves; and never, till this shall be the case, will they obtain those comforts and enjoyments which ought to be in the possession of the industrious labourer, as well as of the wealthy capitalist Every country is essentially the property of its inhabitants; and it is only in ages and in countries where education is partial or unequal, that wealth and the enjoyments of life can be very greatly different.

BOOK II.

DESIGNS FOR FARM HOUSES AND FARMERIES, COUNTRY INNS, AND PAROCHIAL SCHOOLS.

701. *The Designs which compose this Book* are calculated for three of the most important occupations of man in civilised society; viz., that of raising food on a large scale; that of furnishing all domestic comforts to travellers and others, who are absent from or have no home; and that of the education of youth. The last subject does not necessarily belong to an *Encyclopædia of Domestic Architecture*; but, as our main object in this work is the amelioration of the great mass of society in all countries, and as we consider education as the source of all amelioration, and, in fact, as the only means of preparing the most depressed part of society for appreciating and obtaining the comforts and conveniences which we are pointing out to them, we find that the parochial school, for the purpose of mutual instruction, is the most important feature for the accomplishment of our object; and, as such, ought not to be passed over unnoticed in a work like the present.

702. *The Arrangement of these Designs* will be in three chapters; viz., on Farms, on Inns, and on Schools. The first section in each chapter will consist of Fundamental Principles and Model Designs, on which the Miscellaneous Examples given in the second section of the same chapter are founded; and the third section of each chapter will be devoted to such Furniture as may be peculiar to the class of subjects of which that chapter treats.

CHAP. I.

Designs for Farm Houses and Farmeries, exhibiting various Degrees of Accommodation, from the Farm of Fifty to that of One Thousand Acres, suitable to different Kinds of Farming, and in different Styles of Architecture.

703. *A Farm House* differs from other dwellings, more in the circumstance of its situation, being adjoining a farmery, than in its accommodation; but still there are some extra-arrangements, which require to be provided for in designing it, according to the kind of produce raised on the farm, the manner in which it is manufactured or disposed of, and the mode of lodging the labourers employed.

704. *A Farmery*, or set of buildings necessary for carrying on the business of a farm, consists of various structures and enclosures; some for lodging animals, and others for securing farm produce, for keeping farm implements, and for other purposes; with yards for enclosing cattle, and for preparing or keeping manure; others for containing ricks of corn, and stacks of hay, or other produce. The house in which the farmer resides is no essential part of a farmery, and is therefore left out of view in this enumeration of its leading features. These features are three: the buildings, the court-yard, and the rick-yard. The rick-yard does not form an essential part of the farmery; because but little inconvenience would result from having the ricks placed apart from the farm; and, indeed, in some parts of Britain the produce of every field is formed into a rick, or ricks, in one of its corners. The two essential parts of a farmery, then, are the buildings and the court-yard; and all the variations of which these are susceptible, in point of design, are founded on their relative position with regard to each other. Thus, all farmeries may be included under two classes; viz., those in which the buildings surround the court-yard, and those in which the court-yard surrounds the buildings; and a model of each mode must necessarily be the groundwork of every variation or combination of the component parts of a farmery.

705. *The Divisions of the Buildings of a Farmery* admit also, to a certain extent, of being founded on model plans; because the animals which, in temperate climates, are to be lodged in them, are every where of the same species, and require the same extent and kind of accommodation and food; because the manner of threshing out grain is, or may be, the same throughout the world; and because the implements to be worked by the same animals cannot differ greatly in bulk in different countries. Previously, therefore, to giving Model Plans for Farm Houses and Farmeries, as a whole, we shall submit General Principles, and give Model Designs and Directions, for the construction of their component parts.

706. *Every particular situation and kind of Field Culture* requires an appropriate arrangement in its Farmery; therefore our object, in giving Model Designs, is chiefly to embody principles in a tangible shape, to which practical men may recur for general rules for application to peculiar localities. The manner of applying these rules we shall

exemplify in a series of Miscellaneous Designs for Farm Houses and Farmeries, most of which have been executed in different parts of Britain, and some in France.

707. *The Arrangement of the first two Sections of this Chapter*, therefore, will be in the order of General Principles with Model Designs, and Miscellaneous Designs with Details and Remarks.

SECT. I. *General Principles and Model Designs for Farm Houses and Farmeries.*

708. *The object of this section* is to show what parts of a farm house are peculiar to it as such, and the best mode of constructing and arranging these; what are the details of a farmery, with the relative position for each object there; and what is the best arrangement for a Farm House and Farmery, as a whole.

SUBSECT. 1. *General Principles and Model Designs for the Arrangement of a Farm House.*

709. *The Interior of a Farm House* may be arranged in three divisions: viz., the apartments of the family, including such of the servants as live in the house; the rooms for farm-house stores; and the places where the in-door business of the farm house is carried on. In farm houses of the smallest size, all these may be obtained under one roof; but in the case of large farms, where fifteen or twenty persons live on the premises, all those offices, or places, in which the in-door business of the farm house is carried on, such as the dairy and its appendages, the cider-house, the brewhouse, the bakehouse, the wash-house, and the cleaning place, ought to be in a building or buildings separate from the house, but not far distant from it. Cellars of most kinds, however, such as those for potatoes, and other roots or vegetables to be used by the family; for fruits; and for beer, ale, wines, &c.; and the larder, pantry, and coal-house, may be in the same building as the farm house.

710. *Of the Apartments for the Family* we need enter here into few details in addition to those which have been given in the preceding Book. The number of living-rooms in a farm house will depend on the extent of the farm, and on the style in which the farmer chooses or can afford to live. The smallest farm-house should have at least one good parlour; and for a farm of 300 acres or upwards, of good productive soil, there ought to be in the dwelling-house, at least two good sitting-rooms, and a small library or office for business; besides three or four bed-rooms, and a nursery. In farm houses where it is the custom to board and lodge the out-door labourers, a larger kitchen will be required for them to dine in, and a larger kitchen range to cook their food. More bed-chambers will also be necessary, and these should always have a separate staircase from that leading to the better rooms. In some parts of Britain where the farmer and his out-door labourers are nearly on a par in point of intelligence and manners, they continue to dine at the same table in the kitchen. This is by no means the practice in districts where the farmers are highly intelligent, and superior in their manners to their servants, as, for example, in East Lothian; but when the latter are raised nearer to the level of the former by the universality of education, this excellent patriarchal practice will in all probability be restored.

711. *The Sleeping-Rooms for unmarried Farm Servants*, in most parts of Britain, are generally such as merit extreme reprobation. These of the men are frequently in lofts over stables or cow-houses, without light, or sufficient space for air; subject to the deleterious exhalations arising from horse or cow dung; sometimes badly ventilated, and at other times under a roof insufficient to exclude the wind and the rain. Female servants are lodged in-doors, but often in damp back-kitchens, store-rooms for the coarser articles, harness-rooms, dark closets, or low, ill-ventilated garrets. "I am sorry," says the excellent and benevolent Mr. Waistell, when speaking on this subject, "that the health of servants is often less attended to than the health of cattle. Too often," he adds, "there is neither chimney nor window by which to ventilate servants' bed-rooms, and when there is no window they are not likely to be properly cleaned. What renders them still worse is, their being partly occupied as store-rooms for green fruit or bacon, or for drying new-made cheese: the effluvia from all these articles contaminates the air, and renders it greatly injurious to the health of those who breathe it; indeed, all strong-scented bodies, placed in bed-rooms, are more or less pernicious. I shall, therefore, enumerate," he continues, "a few more of those things from which farmers and their families not unfrequently suffer in their healths, without being, perhaps, at all aware of their pernicious effects. The air of rooms is rendered unwholesome by keeping in them oil, oil colours, impure wool, sweaty saddles, soap, tallow, fat, fresh meat whether raw or dressed, wet clothes and other wet articles; by foul linen, washing, drying, and ironing; by the fumes from charcoal fires, which are extremely pernicious, and frequently fatal; by green plants, and flowers however fragrant; and by saffron and hops, which last articles, Dr. Willich says (*Encyc. of Dom. Econ.*), have also sometimes proved fatal." (*Waistell on Agricultural Buildings*, p. 22.) There is no department of farm architecture

in which reform is more necessary than in the rooms appropriated to unmarried servants; unless, indeed, it be in the cottages of the married ones. The state of both in Britain is disgraceful to the farmers and their landlords.

712. *The Places in which the ordinary Farm-House Stores are kept* are, the potato or other root-cellar, the cabbage-cellar, the liquor-cellar, the fruit-room, the cheese-room, the larder, the pantry, and the coal and wood cellar. In general, all articles that are not frequently wanted are better kept in a dry cellar than any where else, because they are there less subject to atmospherical changes. If cellars, however, are damp, they are unfit for storing up any thing except liquors in glass or in earthen vessels.

713. *In the Construction of Cellars* the first thing is, to provide such a drainage as will draw off the water at least one foot lower than the surface of the cellar floor. If the soil be naturally wet, this floor, which should be of flag-stones or tiles, should be laid hollow; the walls should also be built hollow, and, if convenient, with a powerful cement, rather than with common mortar; or, at least, they ought to be coated over with cement in the inside. In all very cold or very hot countries, provision should be made for double doors and double windows, even though the inner window should be nothing more than a boarded shutter; and the windows, in all such cases, ought to fit tightly. The space between the double windows need not be more than from six inches to a foot; but the space between the double doors ought to be at least three feet, so that the one door may always be shut before the other is opened. In cellars so constructed, even ice, enveloped in abundance of straw, might be kept without danger of melting; and it is so kept in most of the confectioners' cellars in London. As cellars are not places to live in, they need not necessarily be made higher than seven feet. In general they are better underground, and arched over with masonry; but the same results may be obtained above ground by double walls, very small and double windows, double or thickly thatched roofs, and double doors.

714. *The Potato and Root Cellar* may be under the floor of some part of the house, when the soil is dry naturally, or capable of being rendered so by drainage. The opening by which the potatoes or other roots are introduced should be on the outside of the house, and not higher than the level of the ground, in order that a cart may be set back against it, and the potatoes or other roots shot out and shoveled down the opening. This opening should have double shutters, in each of which should be at least one pane of glass, to admit sufficient light, and yet effectually to exclude the cold in winter and the heat in summer. The panes of glass should be in the upper part of the shutters, so as to be protected, by the lintels of the windows, from the direct rays of the sun; but, if the opening be to the north, this precaution is unnecessary. The size of a root cellar, where the roots are merely for the consumption of the family, need not be large: ten or twelve feet square, and seven or eight feet high, will be sufficient dimensions in a house calculated for from twelve to twenty persons. When there are different roots to be stored in the same cellar, they may be separated by temporary partitions of boards.

715. *A Cabbage-Cellar* is a common appendage to a farm house in Germany, and might well be introduced in Britain and North America. It may be formed either above or under ground, provided it can be rendered quite dry, and lighted by one or more windows, with double sashes, about six inches apart, to guard against extremes of temperature. This cellar ought to be twice as large as the other, because the manner in which the cabbages and other articles are disposed in it requires a good deal of room. The common method is, to cover the floor with soil to the depth of a foot, and to plant in it, at the commencement of winter, full-grown cabbages, broccoli, lettuce, endive, &c., as close together as they can be placed without touching each other. Water is given occasionally in the course of the winter, and the greatest care is taken to remove every leaf as soon as it shows symptoms of decay. The improved method which is adopted in the better description of cabbage cellars is, to surround the cellar with shelves about eighteen inches in width and three feet apart, which, if convenient, may be formed of flag-stone or slate, or, if these materials are not to be had, of strong wood. On these shelves are placed layers of earth, with alternate layers of cabbages or other vegetables; with their tops projecting beyond the shelf, and their roots and stalks bedded in the soil. Where the soil is of a sandy nature, bricks, moss, straw, or some other suitable material, should be introduced in the front part of the soil, to keep it up. Not only the cabbage family, but the lettuce, endive, celery, beet, sweet herbs, and a variety of other culinary vegetables, are kept in this manner from October till May, in Bavaria, Wirtemburg, Baden, and other states. In very severe weather, or when the air is more than usually humid, hot embers are placed on the floor to raise the temperature, or dry the air; or, when the cellar has a chimney-flue, which is the preferable mode, provided it be kept shut when not used, a fire may be made in a small iron stove.

716. *A Cellar for forcing some kinds of Culinary Vegetables* might be formed in every house, merely by placing an iron stove in any cellar sufficiently protected by external

walls. Light is not necessary. In boxes or pots, or in beds of earth on the floor, or on shelves, may be placed roots of tart rhubarb for its footstalks; succory for its leaves; hops for their tops, as a substitute for asparagus; asparagus roots, sea-kale, &c. Potatoes might also be placed in such a cellar, to make them throw out fresh tubers; but, as the young ones so produced would be merely a transfer of nutriment from what we consider a better to a worse state, we cannot recommend the practice as one of utility. Were light admitted into a cellar of this description, mustard, cress, and other small salading might be grown; and roots of parsley, mint, and other herbs, and of beet, sorrel, and other spinaceous plants, for their leaves, might be planted. In short, a good dry cellar with double doors and windows, might, with very little trouble, be made to produce a great many articles of convenience and luxury for the table, which are now grown in glass frames, or hot-houses, at very considerable expense. Every body knows that mushrooms can be grown in a cellar better than any where else. We do not, however, recommend the practice of forcing for general adoption; thinking it, with a few exceptions, in better taste to take the vegetable productions of nature or art in the open air, by turns, in their proper seasons. Our exceptions are, tart rhubarb, sea-kale, asparagus, mushrooms, succory, and small salading; all of which are as good, when forced, as when grown in their natural climate.

717. *A Fruit-Room, or Fruit-Cellar*, is essential to every farm which has an orchard; and no farm ought to be without one where fruit will grow. The great art in preserving fruit is, to keep it dry, and, at the same time, so as to prevent evaporation from its surface; for this last purpose, all change of temperature and moisture in the air must be guarded against. The simplest mode of effecting these objects is, to place the fruit on a thick bed of dry straw, and to mix and surround it with an ample mass of the same material in any situation dry and protected from the weather; but a better method is, to place the fruit in a dry cellar, on a layer of dry sand, and to cover it with the same material, or with fern, finishing with an upper layer of straw. The superiority of the sand consists in its coolness, and comparative freedom from air, by which the fruit is less liable to wither. Where there are several kinds of fruit to be kept in one cellar, shelves may be employed; and if the cellar be not often entered, so as to admit air of a different temperature or degree of humidity, the fruit need not be covered at all, or may only have fern strewed over it. Where the situation does not admit of an under-ground fruit-cellar, a fruit-room may be formed above the surface, with thick or hollow walls, and double doors, windows, and roofs. The size for a fruit-cellar, on a farm of even considerable extent, need seldom be more than an area of ten feet on a side, and seven feet high.

718. *Cellars for Liquors*, including ale, beer, cider, wine, and spirits, are essential to every farm house. In even the smallest there ought to be one cellar for beer, empty casks, brewing utensils, &c.; and another, opening out of it, for ale, wines, and spirits. The area of the former, in the smallest farm house, should not be less than twelve feet by twelve feet; nor that of the latter less than six feet by eight feet. The beer-cellar, and that part of the wine-cellar which is to contain ale, should have brick or stone benches or shelves built solid, or on arches or piers about two feet high, on which to place casks, for the greater convenience of drawing off their contents. That part of the inner cellar which is to contain wine should be fitted up with cells, or bins, one above another, of about two feet broad, and the same height, and of any convenient depth, provided it be a multiple of the height of a common wine bottle. A part of the wine-cellar should be fitted up with stone shelves, for spirits or other liquors, and for various articles which are best preserved in the temperature of a cellar.

719. *The Larder and Pantry* are conveniently placed near each other, and close to the kitchen. Both ought to face the north; and the former more especially ought to be thoroughly ventilated, by openings near the floor on one side, generally in the lower part of the door, and near the ceiling, generally in the outer wall, on the other. Both larder and pantry should be fitted up with shelves and hooks; and the larder may have a wooden grating or cradle, called a rack, three or four feet wide, about one foot deep, and of any convenient length, suspended from the roof, for the purpose of holding bacon. In old farm houses these racks are generally placed in the kitchen, but in very large establishments, or where bacon forms the principal animal food of the labourers, as it does in the midland counties of England, there is often a separate room fitted up with racks and shelves, set apart for keeping it.

720. *A Salting-Room* is necessary in every house where the farmer occasionally kills his own meat. The effluvia from this room being both disagreeable and deleterious, it should, when convenient, form one of a detached group of buildings. In small establishments, or where only a part of the meat used is killed at home, an airy cellar, facing the north, may be employed. The room should be fitted up with strong benches for cutting up the meat, and salting it on; and fixed long shallow troughs, generally lined with lead, for holding the sides of bacon, &c., while in pickle. These troughs should be provided

with cocks, or holes with plugs, at the bottom, for the purpose of drawing off the brine, and cleaning them; the brine, when boiled and skimmed, being fit for use several times. Smaller troughs, or round earthenware pans, are generally employed for holding tongues, pieces of beef, and other smaller articles; and the whole should be carefully provided with the means for being kept clean, by having pipes of water conducted into it, and the floor arranged so as to have a gradual inclination towards a corner, having a trap and drain.

721. *The Coal-house and the Wood-house* should always be adjoining the kitchen or back kitchen, and both should be perfectly dry; since whatever moisture is added to fuel, beyond what it contains in combination, must be driven off before combustion can take place; and this must always occasion a certain loss of heat. Both places ought to be of considerable size, because in well regulated farms there are only certain periods of the year when the farmer finds he has leisure to bring fuel from a distance, and to store it up: he will also by the same means be enabled to take advantage of a temporary depression in the fuel market.

722. *A Tank, or a Well for Water*, is essential to every farm house, independently of the provision of water for the farm-yard; but we have already sufficiently enlarged on this subject in § 30 and § 151; and the subject of supplying water to the farm-yard will occur hereafter.

723. *A Place for brushing Clothes, and cleaning Knives and Shoes, &c.*, should form part of the arrangement of every farm house; and as this is necessarily a place where much dust and dirt are generated, it should be kept apart from the house, and especially from the back kitchen, which is too generally made use of for these purposes. As a mere open shed, which every countryman may erect for himself, will suffice for a cleaning place, there can be no sufficient excuse for not having one adjoining every farm house; and, indeed, every labourer's cottage or human dwelling whatever. Conveniences of this sort, which are within the reach of every one, and which may be obtained rather by thought and contrivance than by expending any considerable sum of money, are indeed some of the distinguishing marks of a high state of civilisation and refinement. A savage is satisfied with mere food and shelter; and, if he pretends to more, takes delight in showy or gaudy ornaments; but the man whose mind has been enlightened by education prefers simplicity in decoration, and only employs his leisure time and money in contrivances to lessen human labour, and obtain the greatest possible proportion of comfort which his opportunities will permit. Ample apartments and sumptuous furniture can be obtained but by few, and, as they contribute little to happiness, are not worthy of becoming objects of ambition to any rational being; but a clean, comfortable, and well arranged home is an essential ingredient in human happiness, and, as such, ought to be sought after and obtained by every one. Cleanliness is also essential to health; and this blessing, so desirable in every condition of life, is particularly so to a labouring man, as without it he cannot perform his daily toil.

724. *The Wash-house, Bakehouse, and Brewhouse*, in small farms, are commonly all united in the back kitchen; but in extensive establishments they, together with the laundry, dairy, cheese-room, cider-house, salting-room, and smoking or curing room, should be in a building or buildings apart from the house, but connected with it by a covered way.

725. *The Wash-house* should be well lighted; and therefore, if united with other offices, it should, if practicable, be made a corner building, and have windows on two sides. Instead of portable round tubs, which, as noticed in the preceding Book, are the most inconvenient of all the forms that could be devised for washing by hand, oblong troughs, about three feet in length, eighteen inches wide at top, one foot wide at bottom, and eighteen inches deep, should be fixed round the two lighted sides of the room. Each trough should have a hole and stopper in the bottom; and close under these holes should be a gutter, common to all the troughs, which may convey away the waste water to the manure tank. In one corner or side of the room the boiler should be placed; and over it a supply pipe from a cold-water cistern. Pipes may be conducted from both the cold-water cistern and the boiler, so as to deliver, on turning cocks, cold or hot water, at pleasure, into each trough. The main part of the washing, however, we should propose in all cases to be done by a washing-machine, of which we shall hereafter give an improved Design; and this, with a pressing or wringing machine hereafter, may be worked by a horse or steam power, which may also be applied in churning and other operations, to be carried on in this department of the farm offices. The floor of every washing-house ought to be very carefully paved, with an inclination of an inch in a yard towards one corner, in which there ought to be a trap drain leading to the manure tank. This inclination, which will hardly be perceptible to the eye, or recognised in standing or walking, will yet be most useful, by directing all the water, which must be occasionally spilt on the floor, to the point where it will be carried off. Close under the ceiling there ought to be several openings communicating with the open air, to carry off the steam, and

in the bottom of the door there ought to be correspondent openings to admit fresh air: both openings ought to have shutters sliding in horizontal grooves, with hooks in them, so as to admit of their being easily drawn back, or pushed forward.

726. *The Laundry*, the business of which in small dwellings is generally performed in the kitchen, may be very conveniently placed over the wash-house; and, like it, should have windows on two sides, and ventilators under the ceiling, and in the bottoms of the doors. Against the two lighted sides, tables or flaps for ironing on may be fixed; and in the corner behind, directly over the boiler, may be placed a drying-closet; which may be partly heated by the flue from the boiler, and partly by the requisite ironing-stoves, or by a steam-pipe. If the laundry should be placed on the same floor with the wash-house, it should adjoin it, so that the back of the boiler fire may heat the drying-closet. In this closet the clothes may be dried by the arrangement described § 306. Where a drying-closet is not used, the clothes may be dried, as is usually done, in the open ironing-room, either on common clothes horses, or on rails suspended from the ceiling by ropes and pulleys, so as to be raised or lowered at pleasure; or by lines stretched across the room, which may also be raised or lowered by means of pulleys. The last mode may be very completely effected by having the pulleys to work in vertical grooves, or in hollow rods similar to that invented by Mr. Vokins for hanging pictures, to be hereafter described. The mangle may stand in the middle of the room, or on the dark side not occupied by the drying-closet.

727. *The Bakehouse* should be close to the wash-house, in order that their united flues, with those of the dairy, scullery, and the brewhouse, may form one stack. The bakehouse may have light on one side only. The oven should be lined with fire-bricks; and immediately without its iron door there should be a grating over an ash-pit, for the reception of the ashes when it is cleared out. Height in an oven is of no use, but rather tends to bake the bread unequally: eighteen inches will generally be found sufficient for private ovens, and the length and width need not be more than three or four feet. Against the light side of the bakehouse should be placed a flap or table, for making up the loaves on, with a kneading-trough close to it; and near the kneading-trough should be a flour chest or cask. If a kneading machine be employed, which for large families ought always to be the case, not only from the saving of labour, but from the greater certainty of cleanliness, and the more thorough working of the dough, it should take the place of the kneading-trough. In the largest private establishments it may also be found worth while to construct the oven on Hicks's plan, so as to be able to condense the spirituous vapour produced from the dough while baking. The plan will be found detailed at length in the *Repertory of Arts*, new series, and in *Mech. Mag.* vol. xiv. p. 417.

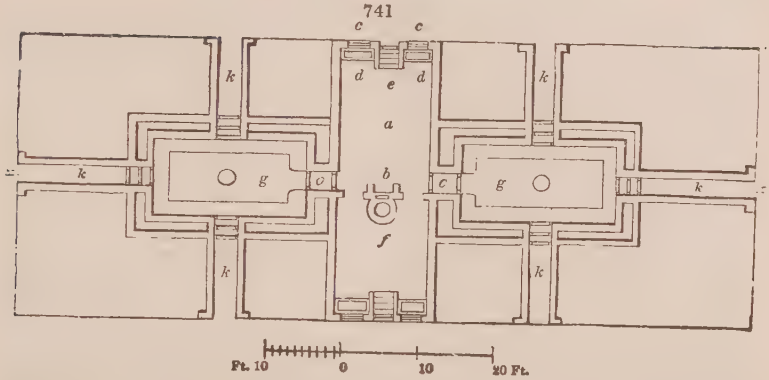
728. *The Brewhouse*, for the reasons before given, should adjoin the wash-house and the bakehouse. It should occupy two floors, in order that the malt may be placed in the upper floor, and be conveniently put through a shoot into the boiler, which should be near the ceiling of the lower room, to allow of the liquor or wort being conducted from its bottom by pipes or tubes to the coolers, which again should be sufficiently raised from the ground floor to allow of casks being placed under them, so as to be filled without trouble; or, where it is practicable, a small pipe may be conducted at once from the coolers to the beer-cellar in the house. Where the cellar is under the brewhouse, which, however, is seldom desirable when the latter is detached from the farm house, the same arrangement may be adopted as that mentioned § 498.

729. *The Dairy* is one of the most important of farm-house offices, and yet it is seldom properly constructed. The desiderata are, equality of temperature during every season of the year; and frequent renewal of the air, so as to have it perfectly fresh and sweet. Equality of temperature is easiest obtained when the dairy is under ground; but in this case the ventilation is insufficient to supply the other desideratum. Where the dairy is in a detached building, a compromise between a cellar and a room above the level of the ground may be formed by sinking the dairy two or three feet, and covering the outside of the walls and the roof very thickly with thatch; or by forming the walls hollow, and raising against them a bank of earth covered with turf. One of the most complete modes is, to form the walls hollow, and to throw over the room two or three arches of masonry, one above the other, covering the whole with a mound of earth, like that of an ice-house, but with proper windows for light and ventilation, protected from the covering mound by projecting side walls, with lintels or arches over them of corresponding depth. The windows, in this and in every case, should face the north, or north-north-east, or north-north-west, and should be double; the outer window fixed and of wirecloth, and the inner one of glass and to open. There should also be double doors, and the space between them should not be less than three or four feet. In both doors there should be panels of wirecloth, to exclude the flies, and yet admit the air. In the most severe weather of winter, the wirecloth of both doors and windows may require to be protected by temporary shutters of either mats or boards.

730. *Where the dairy is connected with a group of other farm-house offices,* including the dairy scullery, cheese-room, cheesepress-room, &c., it may occupy the north angle, or part of the north side of a square mass of building. The walls should in this case also be double, and the windows should be treble; the outer one of wirecloth, and the two inner ones of glass. There should be double doors, and care should be taken that one should always be closed before the other was opened, and that neither should ever be left open for more than a few minutes at a time. To compensate for all inequalities of temperature, there should be a power of introducing a stream of water to run through the dairy, or spring water from a well, tank, or spring, so as to cover the whole of the floor, or to sprinkle it and the shelves, at pleasure, and thus reduce the temperature of the air in summer, or raise it in winter. To do this more rapidly, part of the floor may be perforated, and from each small hole a jet of water may be contrived to rise, on turning a cock; or perforated pipes may pass under the dairy shelves, and under the middle part of the ceiling; and from these there may be a power of producing an artificial shower to raise or lower the temperature at once. The process of introducing water in this way, either from the floor or from the ceiling, may seem at first intricate and expensive; but whoever has seen it done in Messrs. Loddiges's palm-house will allow that it is neither. We shall give some details hereafter, when speaking of fountains for villas. Common lead pipes, of half an inch in diameter, may be used; and the perforations may be made with a stout sewing needle. The only matter of expense is the tank, or cistern of water, which should be so placed as to maintain the same temperature throughout the year; and at the same time be above the level of the dairy ceiling, so as to give due force to the delivering pipes. If, however, the dairy be properly constructed, and a power contrived for flooding its floor with water (and, if no permanent jet can be made, this may be done by a common watering-pot), the two grand desiderata may in every case be certainly and economically obtained. The floor should be accurately paved, and should slope to a trap drain in the corner, as before directed for the washing-house. The shelves and benches should be formed of thin flag-stones, or slates, or of wood covered with lead; the walls and ceiling should be plastered with cement, or coated with a firm-setting mortar, or should be inlaid with glazed tiles. The milk-pans are better portable than fixed; because, if fixed, they must be scalded in the dairy; and hot water should never be introduced into it, in summer at least, on account of its raising the temperature. Even milk directly from the cow should be allowed to stand to cool in the dairy scullery, before it is taken into the dairy; because its temperature, when in large quantities, either in summer or winter, would soon raise that of the apartment. A thermometer should be kept in the dairy, and the temperature should be never allowed to fall below 50°, or rise above 55°; experience proving that most cream is thrown up by milk in a medium between these degrees. If at any time in winter the temperature of the dairy should fall too low, vessels of hot water may be carried in and set down on the floor, or the milk, in such a case, may be sent in direct from the cow. No articles of food, but milk, cream, and fresh butter, should ever be kept in a dairy; nor, as Waistell tells us, should any thing that has a strong scent, even though it may be sweet, be placed in or near it. "Bad scents," he says, "greatly lessen the product of butter dairies, by preventing the complete separation of the cream from the milk." It is also certain that raw meat, if kept in a dairy, has such an effect upon the cream as to prevent the butter produced from it from keeping. This, and the facts stated by Waistell, it is difficult to account for, but not more so than others equally well ascertained; such as the influence which the leaves of certain milky-juiced trees, such as the papaw tree and the fig for example, have in intenerating fresh meat.

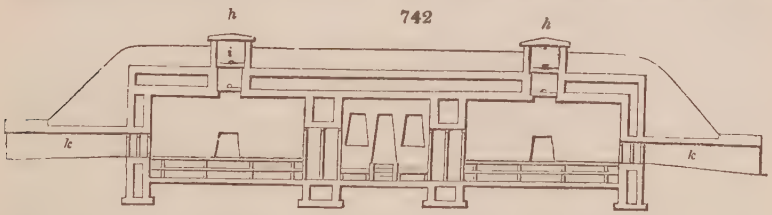
731. *The Dairy Scullery* should be near the dairy, though not immediately adjoining it: it should have a boiler for heating water, and two underground pipes with traps; one for foul water, communicating with the liquid manure tank, and the other for waste milk, communicating with the pigs' food tank. From the latter pipe there may also be a communication with the dairy; because it may sometimes be advisable to empty out milk there, without bringing it into the dairy scullery. The churning may be carried on in the dairy scullery; for which purpose, on a large farm, provision ought to be made for the introduction of a shaft from a horse or a steam power for working the churn. There ought to be fixed benches and movable forms, for setting milk-pans and other dairy utensils on; and a portable rack with a wheel and two feet like a wheelbarrow, for draining the pans and pails, and wheeling them out to a shed to dry. Figs. 741 to 746 show a Design for a double dairy, which will keep the produce at a proper temperature, in whatever climate it may be built. It may also, with very little alteration, be partly or chiefly used as an ice-house, or as a wine or ale cellar. We shall first describe it as a dairy. Fig. 741 is the ground-plan, in which *a* is an outer room, for airing and drying the utensils, or for drying cheese; being warmed by an open fireplace at *b*, and lighted and ventilated by two windows. *c c*, beneath which are two elevated sinks, *d d*.

741



close to one of which is a Siebe's pump, from a well or tank common to the whole dairy. It will be observed, by the five steps at *e*, that the floor of this building is three feet below the common surface of the soil. The room marked *f* is the dairy scullery; in which may be observed a boiler, two windows, two sinks close to one of which is a Siebe's pump, and five steps at the entrance door. In this room the dairy utensils are to be washed; and churning may be performed, if it should be a butter dairy; or cheeses pressed, if the object should be cheese-making. In both these rooms there should be traps to a common drain; and from one of the sinks in each room a bell trap communicating with the pig's food tank, unless the piggery should be at such a distance as to render it more economical to convey the milk thither in wheelbarrow tubs. The two milk rooms, *g g*, are to the right and left of the lobby or drying-room; and these are surrounded by slate or thin stone shelves two feet broad, with smaller shelves beneath them eighteen inches broad, indicated in the section, fig. 742. Each range of shelves has two small

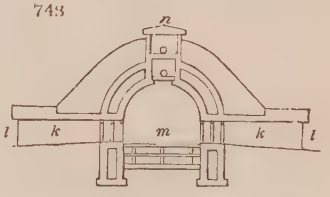
742



sinks, at the two corners next the lobby and scullery: one of these sinks is for waste milk for the pigs, and the other, which has a Siebe's pump close beside it, for waste water. It is to be observed that we mention Siebe's pump, because it goes into less bulk than any other; and, indeed, when the handle is taken off, and an escutcheon put over the keyhole, no appearance whatever of a pump is discernible. These pumps are also worked in much less space than any other. In the centre of the floor of each of these milk-rooms is a small circular basin, and under the shelves in each is a trap to a drain. There are skylights directly over the two circular basins, which are seen in the section fig. 742, at *h h*. These are covered with glass cases, which project and are open at the eaves; and under these are other glass cases, *i i*, which are lifted out during summer, but put in again during winter for the purpose of retaining heat: below these cases are wire-cloth frames, which remain on always, in order to exclude the flies. There are three windows, *k k k*, in the side walls of these milk-rooms, with three frames, shown both in the plan, fig. 741, and in the section, fig. 742. The outer frames of these windows are filled in with wirecloth, and fixed; the two inner frames with glass, each in two vertical divisions, hinged, so as to admit or exclude air at pleasure. There are double doors to each of the rooms, one of which is chiefly of wirecloth, and the other of wood, so that ventilation may be allowed to take place from or to the drying-room, *a*, as may be required to warm or cool the milk-room. It will be observed that the milk-room is surrounded by double walls; and by the section fig. 742 it will be seen that the whole is covered with a mound of earth, which necessarily produces the long tubular openings to the side-wall windows, *k k*, so favourable for producing currents of air during the warm season, and for tempering the frosty air during winter. Fig. 743 is a cross section,

in which *l l* represents the ground's surface, *m* the top of the upper milk shelves, and *n* the skylight. It may be observed that, instead of employing glass and wirecloth frames for these skylights, vessels of water with glass bottoms might be introduced; which, while they admitted light, would exclude heat in summer and cold in winter; and they might be rendered further useful, by having openings in their bottoms, to be regulated by cocks within the dairy, so as to allow water to drop down on the basin below, whenever it was desirable to increase the coolness of the temperature. The vessel might be covered above with a skylight, and supplied either by the Siebe's pump within the dairy, or by a pipe and ball-cock from some exterior source. The water might contain gold and silver fish. The glass might be stained, as might that of the side windows; and, instead of a small circular basin in the centre, there might be a deep well for containing very cold water. — We shall now describe this building as two ice-houses with a dairy between. The shelves of the milk-rooms should be removed, and the windows closed up entirely; and, instead of a skylight at top, there should be three flag-stones substituted for the frames containing the upper skylight, the under skylight, and the haircloth, and resting on the same ledges on which they rest. There are three offsets or ledges, shown at *h i*, in the section fig. 742, for this purpose. The object of leaving these openings in the ceiling is to put in the ice; and this being done, and the flag-stones replaced, the space between them should be filled in with barley straw. The traps to the drains before mentioned will serve as conduits for such water as may be produced by the thawing of the ice; the well in the centre will also hold a part of this water, which will be valuable for its coolness even after the ice is gone. The spaces *o o*, between the doors, must be kept constantly filled with straw cushions. The room *u* may be fitted up with shelves as a dairy, the chimney being turned into a ventilator; and the room *f* may remain a dairy scullery, as at present. For a wine or beer cellar this building is admirably contrived, whether for a very warm or a very cold climate. The wine or ale may be kept bottled in bins, or in casks on benches, in the milk-rooms; and it may be supplied to customers in the room *u*, while the cleaning operations go on, and the attendants wait, in the room *f*. Wine and ale cellars of this description are little known in Britain, though there used to be a wine-cellar for draught wine near old London Bridge; but in Germany they are frequently to be met with. There is a very large one at Munich, covered with an immense cone of earth, in which ale is kept and drunk at the same temperature both in the hottest summers and the severest winters of that climate of the most opposite extremes. There is an excellent one at Silberberg, near Stuttgardt, both for ale and wine; and there are nume-

743



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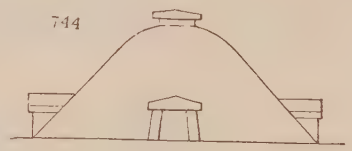

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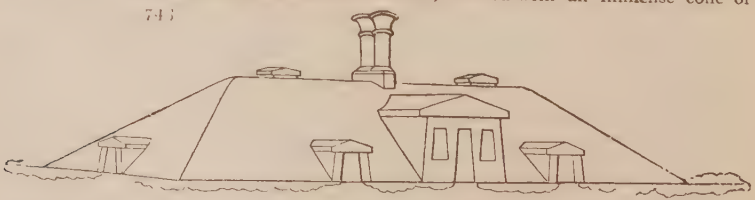

rous others in the neighbourhood of Vienna, which no doubt are familiar to many of our readers. By a third arrangement, one of the milk-rooms might be made a dairy; the other milk-room a wine and ale cellar, and the lobby a drinking-room. The appearance of such a construction, to whatever use it may be applied, when covered with green turf, need not be disagreeable; we have given the architectural parts something of an Egyptian character, as may be seen in the elevation of the end, fig. 744; of one side, fig. 745; and in the perspective view, fig. 746.

732. *The Cheesepress-room* may be very properly placed between the dairy and the dairy scullery. It should be surrounded by shelves, and the presses may stand in the middle of the floor. The shelves should be grooved across, with a small gutter suspended in front, to collect from the grooves the whey which runs from new cheeses, for a day or two after they are taken out of the press, and before they are carried up into the cheese-room. These gutters may deliver their contents into one upright pipe, communicating with the pig tank. As a good deal of whey will also run from the cheeses while in the presses, grooves may also be formed along the floor communicating with the same pipe.

733. *The Cheese-room* may be over the cheesepress-room, the dairy, and dairy scullery. There should be windows on opposite sides of this room, for thorough ventilation; and these windows should have outside wire shutters, to exclude flies and vermin, and yet admit a free circulation of air. The best position for the shelves is in the middle of the room, so that the cheese may have air on all sides. The shelves should be of the breadth of the cheese intended to be made, and should be perfectly smooth and level. They may be supported from the floor, or, if danger from mice be anticipated, suspended from the ceiling by iron rods.

734. *A Drying-shed* is a useful appendage to the back kitchen, dairy scullery, wash-house, and even brewery. It is useful not only for drying every description of wooden vessel, but even clothes, leaves, such as those of tobacco, ears of maize, garden seeds, &c. In old English farm-houses, the penthouse, or far-projecting eaves, supplied the place of this appendage; and in Switzerland the galleries answer the same purpose; but Waistell, by far the best British writer on farm buildings, as Morel-Vindé is by far the best of the French writers on the same subject, recommends that a drying-shed should be built on purpose. We are decidedly of the same opinion, unless verandas connecting the different parts of farm offices, and forming covered passages between them, can be made to serve the same end.

735. *The Cider-house,* on a small farm, where cider is not made for sale, may be dispensed with, and the apples ground in the churning-room, or in any room or shed where steam or horse power can be applied to turning the grinding rollers. On large cider farms, the cider-house requires to be of considerable size, for holding the fruit before and after it is ground, and for holding the rollers or mill for grinding it, and the press. In Worcestershire the dimensions of the best cider-sheds are twenty-four feet in length by twenty in breadth. The rollers are turned by horse power, communicated by a gin wheel operating on a pinion on the end of a horizontal shaft, in a similar manner to what takes place in a horse churning or washing machine. The cider-house is occasionally open on one or more sides, and the liquor, after being expressed from the pulp, is carried in pails to the cider-cellar, which is commonly under the dwelling-house; but a better mode would be, to have a cellar under the cider-house, and to let down the liquor into the casks by pipes, in the manner suggested for the brewery, § 728. The floor ought to have an inclination to a trap at one corner, in order that it may be easily washed; and this trap ought to communicate with the manure tank. A second trap and pipe should lead to the pig's food tank, to pour down it such liquor as may not be fit for putting in the casks.

736. *An Ice-house* for a farm house may be considered a superfluous appendage in Britain, but it is common on the farms in America, and therefore its construction deserves a place in this work. There are various descriptions of farms in Britain, particularly those belonging to public-houses and inns, to which an ice-house would be a most desirable appendage; not only as affording the means of preparing ices, cooling wine, &c., but as supplying a place for preserving fish, meat, fruit, and vegetables fresh, much longer than can be done by any other means. The simplest mode of keeping ice is by enveloping it in an immense body of loose straw above the surface. For this purpose, the first operation is to form the surface of the ground into a flattened cone, for the sake of drainage when the ice happens to melt; next, put on a layer of faggots, and straw a foot or more in thickness; then lay on the ice, in a conical mass, the larger the better, and cover it with straw to the thickness of one foot, and afterwards with faggot wood to the thickness of two feet, for the purpose of preserving a stratum of air above and around it; lastly, cover the whole with two or three feet of straw, arranged as thatch. The ice will now be surrounded on every side by such a powerful non-conducting medium, that scarcely any heat from the atmosphere will be able to penetrate to it; while whatever portion of

it may thaw will find its way off through the under stratum of faggots, without the admission of air. Ice has been kept in large quantities in this manner both in England and America, throughout the year. The best situation for such an ice stack is under the shade of trees, or under a shed roof, closed on the south side, and open on the north.

737. *An underground Ice-house* may either be a large cellar, with hollow walls, hollow floor, hollow roof, and double doors; or, it may be a separate structure, in the form of an inverted hollow cone, with a drain and trap at the bottom, and double doors on one side at the top. When a cellar is employed as an ice-house, a proper drain and trap should be provided in the lower floor, for carrying off such water as may be produced by the melting of the ice, without the risk of introducing air. When the ice is about to be put in, the floor and sides of the cellar are thickly coated over with strong wheat straw, or reeds, as a powerful non-conducting medium. Double, treble, or quadruple doors are always requisite to an ice-house of this description, according to the use which is to be made of the space between the doors. Where these spaces are to be used as pantries, four doors are requisite; and two should never be opened at once. The space between the outer door and the second door should always be kept filled with straw, and that of barley is found better than the stiffer straw of wheat, rye, or oats. The space between the second door and the third should, if possible, be kept filled with straw also; but the space between the third door and the fourth should be of sufficient width to admit of its being fitted up with shelves, on which the articles to be preserved fresh are to be placed. From time to time, the door of the ice-house may be opened, in order to reduce the temperature of this space, and to freshen the air. In some cases there is a movable shelf or table placed over the ice, immediately within the inner door, as a substitute for the shelves in the passage. When an ice-cellar cannot be formed under or adjoining a dwelling, it may be constructed above ground, even on wet soils, covered with a mound of earth, and that mound further protected by trees, evergreen shrubs, or, what is equal to any thing as a non-conductor, and at any rate far superior to deciduous trees, ivy. The common form of out-door ice-houses, is, as we have before observed, an inverted cone, and the supposed advantage of this form is, that, as part of the ice thaws, the remainder slides down the sides of the cone, and still keeps in one compact body. This is no doubt true; but the advantage by no means compensates for the difficulty of constructing an ice-house in the conical form. A plain square room, with double side-walls, say a foot apart, a double arch over, and a double floor under, which can be built with the same ease as any common cellar, will, all other circumstances being alike favourable, keep the ice as long as any conical form whatever. Where there is a doubt of being able to exclude the heat, treble walls, roof, and floor may be resorted to; and the entrance, which should always be three or four yards in length, instead of being straight, may be made crooked, with a door at each turn. The space between at least two of the doors should always be filled with straw; and, to render the removal of this straw easy, when passing from the outer door to the ice-house, it might be put into two or more canvass bags, like immense cushions, which might be hooked to the ceiling and the sides, so as to close up every interstice. The space between the second and third doors may always be widened, and fitted up, as before described, with shelves for holding articles which require to be kept cool, but not to the same degree as if they were placed in the ice-house. It ought always to be recollected that any perfectly dry cellar may be made an ice-house, by employing faggots as well as straw, in the manner we have described as proper for preserving a stack of ice above ground. The French preserve ice in frames of wood-work suspended in cellars or pits, in the form of inverted cones, surrounding the whole with a thick covering of straw. Both the French and Italians also form ice-houses in dry, chalky, or calcareous soils, deep under ground, where neither drains nor straw are necessary, with the exception of as much of the latter as will close up a long circuitous opening. In England, many persons are deterred from forming an ice-house, by the idea that the form of an inverted cone is essentially necessary to it; that it must be under ground; and that ice is only useful for making ice-creams and cooling wines: but an ice-house may be made any where; and, as a place for preserving meat, fish, fruit, and vegetables, there is not a more useful appendage to a country house. Fig. 747 is a section, and fig. 748 a ground plan, of an ice-house on the inverted cone principle, but of an improved construction. This form, as usually employed in English country seats, very frequently fails in keeping the ice, from not having double walls, and double or treble doors, or from imperfect drainage; but the plan now submitted is free from these defects, and will keep ice throughout the year, in any climate, if covered with a sufficient thickness of earth or straw. In this Design, *a* is the well or cellar for the ice; *b*, a drain from its bottom, for carrying off such water as may be produced by the gradual thawing of the ice; *c*, a trap in this drain, to

prevent the external air from communicating with that of the ice-house; and *d*, a lead pipe from this trap, connected with one of Siebe's rotatory pumps at *e*. The object of this pump is to allow of making use, during the heat of summer, of the very cold water produced by the thawing of the ice, either for cooling wines, or, after filtering it, for drinking. There are five doors to this ice-house, at *f*, *g*, *h*, *i*, and *k*; and a vacuity, *l*, one foot wide, between the two walls, surrounding the cellar, and covering the inner division of the passage, *m*. This passage may be fitted up with shelves, as a place for keeping ve-

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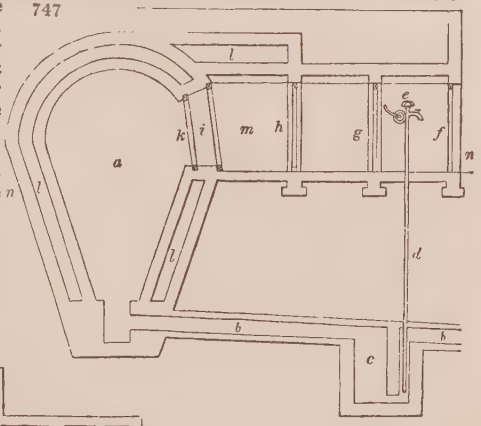

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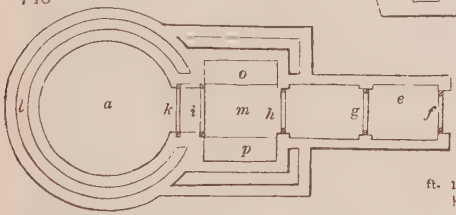

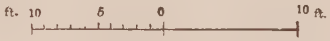

getables, and various other articles of food (raw or cooked), fresh during summer. The natural level of the ground is shown at *n n*; and the whole superstructure may be covered, in Britain, to the depth of two or three feet with earth, planted with ivy, and surrounded with trees. In warmer climates the depth of earth ought to be increased to eight or ten feet. The size of the well ought also to be enlarged, and it might be well to have even a third vacuity round it. The space between the doors *i* and *k* should be filled up by a barley-straw cushion, and it would be well to have similar cushions against the doors *g* and *h*, at least during summer. The two recesses, *o* and *p*, are here shown only two feet in depth; but, by making the walls behind them of brick, that depth may be increased at pleasure. It may also be observed, that, in situations where brick is cheaper than stone, all the walls in this Design may be built, in Dearn's manner, hollow; and that the side walls of the ice-well need not be more than the length of a brick in thickness, the one wall being tied into the other. It may be further observed, that, if it should be inconvenient to cover the building with earth, a covering of straw or reeds, or even planting ivy against the outside walls, and surrounding the whole with a few trees, will be equally efficient in keeping out the heat. If trees cannot be planted, on account of the soil, or of shutting out any view, a slight roof elevated on props of any sort will have the same effect. One of the most effective ice-houses which we have ever seen was covered in this manner, by a wire trellis and Ayrshire roses, mixed with honeysuckles, clematis, and Virginian creeper. Ice-houses, we are persuaded, would become much more general, were country gentlemen fully aware of the fact, that they might be built square just as well as round, and be equally effective at less expense, above the surface than under it. A square ice-house above ground, or sunk three feet into it, may have treble hollow floors formed of bricks on edge, covered with foot tiles or flag-stones; and its side walls may be treble also, of brick on edge, in Silverlock's manner. To form the roof, a nine-inch semicircular arch may be first thrown on these walls, and on this arch three vacuities built of bricks on edge and tiles: there may be five doors, as in fig. 748; and the whole may be covered with a cone of earth, or thatch, four feet thick, and clothed with giant ivy. In filling an ice-house, the ice, being collected and laid down outside of the exterior door, is there broken into small pieces, and reduced to a powder composed of particles not larger than those of sand or salt. It is then carried into the house and thrown down into the ice-well, in which a man is placed with a rammer to beat, and ram it closely; occasionally sprinkling it with a little water to consolidate the whole. An improved method consists in using water saturated with salt, by dissolving ten pounds of salt in ten gallons of cold water, and pouring it on the ice through a common garden watering pot every two feet of thickness, as the house is filling, and finishing with a double quantity of the salt water. "The ice, in houses filled in this manner, will be

found. when opened in summer, to be as firm as a rock, and to require, at all times, the force of a pickaxe to break it up. Thus prepared it will be found to keep three times as long as by the common method in the house, and it will also keep three times as long when exposed to the air, from salt water, and consequently salted ice, having a less capacity for heat than fresh water, or fresh ice." (*Gard. Mag.*, vol. iii. p. 139.)

738. *A very cool Place for the Preservation of Meat, Butter, Vegetables, &c.*, might be formed as follows: — Construct a frame of wooden or iron rods, in the form of a cone, or in any convenient form, and raise it from the ground on pillars between two and three feet high; form a door of wirecloth on one side, and one or two openings as windows, also filled in with wirecloth, on the other. Cover the whole, except the doors and windows, with a coating of cement, and form a double floor of boards. The result will now be a conical bottle of cement, with three wire openings in the sides. Place on the summit of the cone a vessel of water, or conduct a pipe of water there, and allow it to trickle down the sides of the cone, and the greater the heat of the weather, the cooler will the area be made within, by the heat carried off by evaporation. Perhaps it would be better to form the cone over a pit or well, and without any openings in its sides; entering under ground to the pit or well, in which the heavier articles might be put, while the lighter ones were placed on shelves suspended from the roof. In an airy situation, in the shade, it is presumed the temperature, through the continued evaporation of the water, would be kept sufficiently low for every purpose that could be required from an ice-house pantry. Perhaps the water might be conducted more regularly from the apex to the base of the cone, by forming round it a screw gutter, something like the rings of a straw beehive.

739. *A Room for smoking Hams and other dried Provisions* is, in some countries, particularly in Germany and Sweden, a general appendage to a country house or a large farm. It is usually built of stone or earth, and placed apart from other buildings. It may be a square room, ten feet on the sides, and ten feet high, open to the roof; and it may have iron ceiling joists, at about two feet apart, in both sides of which hooks are fixed for suspending the articles to be smoked. The smoke is generally allowed to escape through crevices in the roof, or through chimneys or apertures formed of slates, or thin stones, placed like luffer-boarding; but, in an improved construction, air-hole tiles, like that shown in fig. 434, or central luffer-boarded chimneys which admit of regulation, like those of stables, to be afterwards described, would be an admirable substitute; because, while they admitted the escape of smoke, they would exclude the entrance of rain. In Germany, not only bacon, beef, and mutton hams are smoked in houses of this kind, both as a means of preservation, and to communicate a flavour; but venison, geese, ducks, salmon, cod, haddock, eels, herrings, &c., are so cured. The preserving principle is the pyroligneous acid, which being purer in wood than in coal, the former is always employed. The flavour depends upon the kind of wood used: that most esteemed is communicated by the juniper, with which the Westphalian hams and the Embden geese are smoked. The wood most generally next in use is the beech; but in Sweden and in Pomerania the spruce fir is often used, either alone or in mixture with the birch. In Hampshire, and other counties, where much bacon is smoked, the kiln is egg-shaped, with a door in one side, and a covered chimney on the narrow end: the hams are suspended from hooks in the roof, and a smothered fire of sawdust is kept up on the floor, by throwing on successive handfuls of sawdust. The sawdust of hard wood, such as oak, ash, beech, &c., is preferred to that of resinous trees. In Cambridgeshire, and other parts of England, hams and bacon are frequently smoked by hanging them in a wide kitchen chimney, and making a fire of sawdust on the hearth; and, in the north of Scotland, gentlemen often send their bacon or mutton hams, wrapped in paper, or coated in sawdust, to their tenants, to be hung up in their wide kitchen chimneys where peat is burned below. In the neighbourhood of Aberdeen, and in various places in the north of Scotland, haddocks are strung up on rods called spits, and suspended in wide chimneys, under which peat and sea-weed are burned, and sometimes fir; though the flavour of the sea-weed and peat is greatly preferred. Red herrings are strung by the gills on wooden spits, and these spits are suspended in rows above each other, in a house which is kept filled with the smoke of birch for several weeks. As this process cannot require to be performed more than two or three times a year on a private farm, the same apartment might serve for distillation; or for smoking willows with sulphur, to bleach them, where basket-making was carried on; or straw, where hat-making was practised. In the same room, also, articles of carpentry intended for the open air might be either saturated with pyroligneous acid, or actually charred at the ends to be inserted in the ground. The value of the saturation process is evident from the great durability of the timber of the roofs of cottages which have imperfect outlets for the smoke; many in Scotland, and some in England, might be referred to as examples.

740. *As an Example of the essential Accommodations of a Farm House on a small scale,*

and on the most economical principle of construction, we may refer to fig. 749. The walls of this house may be built of rammed earth, or mud, or clay nogging, or in whatever manner is cheapest and best suited to the particular locality; and, as all the accommodation is on one floor, the highest of these walls need not be more than ten feet above the stone or brick foundation. The accommodations are, an entrance-porch, *a*, facing the south-west; a hall or lobby, *b*; kitchen, *c*; back-kitchen, *d*; place for fuel, *e*; larder, *f*; pantry, *g*; place for fuel for lighting fires, and women's water-closet, *h*; ale and beer cellar, *i*; dairy, *k*; room for potatoes and other roots, *l*; wine and spirit cellar, *m*, with a china closet over, opening from the dining-room; boys' bed-room, *n*; lobby to the three family bed-rooms, and to the private water-closet, *o*; master and mistress's bed-room, *p*; girls' bed-room, *q*; stranger's bed-room, *r*; parlour, *s*; single men's sleeping-room, *t* (the window of which is also a door, by which they can go out early in the morning without disturbing the family); maid-servant's room, *u*; dining-room, *v*; drying-closet, heated from the back of the kitchen fire, *w*; and projection over the oven, *x*. There is a flue from the oven across the dining-room, going round the parlour, and back again; which, with the heat from the drying-closet, will, it is calculated, render open fireplaces wholly unnecessary, and therefore none are shown. By examining the section, fig. 750, the simplicity of the construction of this building will be obvious. The outside walls are only seven feet high, but the capacity of all the rooms is rendered sufficiently ample by raising

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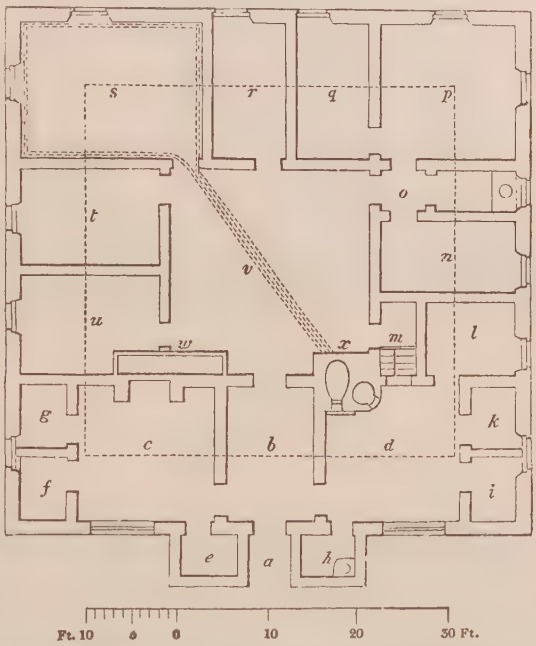

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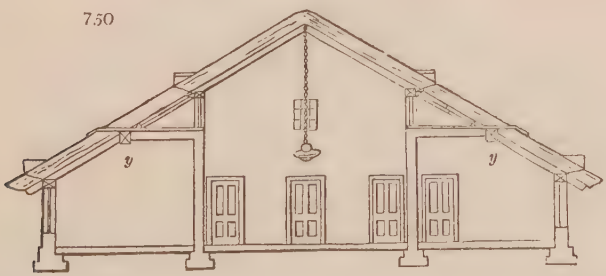

the ceiling, as shown in the section. To admit of raising the ceiling, a chain of purlins, fig. 750, *y*, is placed in the direction shown by the dotted line *c b d*, &c., in fig. 749, and is carried round the house. These purlins are supported by the cross walls; and on them, and on the wall surrounding the dining-room, the rafters, which are of short lengths, find a secure support. From the entrance-door to the door of the dining-room there is a rise of two feet, effected by an inclined plane; and there is also a declination from the door of the back-kitchen to that of the root-cellar, also of two feet, by which

means the fireplace of the oven is sufficiently low to admit of the flue from it passing under the dining-room floor; or the same purpose may be effected by having a few steps down to the oven furnace. There may be an upright flue from the oven, for use during summer. The stairs down to the wine-cellar are shown with a line across the steps, indicating that it is to be constructed with double treads, in order to gain space, as shown § 164, fig. 137. The windows in the roof are double; the outer sashes being glazed with small panes, to resist hail; and without cross bars, like hot-house sashes. The inner ones are upright, and hung in the usual manner. A line passed diagonally

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through this house, from the south to the north, should intersect the centre of the farm-yard, which would thus be completely overlooked from every part of the parlour, *s*, which for that purpose has windows on both sides. Fig. 751 is the elevation of the entrance,

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or south-west front; fig. 752 that of the south-east front; and fig. 753 is a perspective view. This building might be erected, in the neighbourhood of London, reckoning

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labourers' wages at 18*s.* a week, and carpenters' at 25*s.* a week, for £250; and, were there no duty on glass, the sum would be much lower; because, the floors and walls being of earth or composition, and the roof of short pieces of timber and thatch, the chief expense is incurred in the doors and windows.

741. *A Farm House with an enlarged degree of Accommodation*, but still on the most economical plan, for a country where the cheapest material for the walls is earth, and for covering the roof, thatch, might be formed from the same ground plan, with a story over it. The change in the destination of the apartments shown in fig. 749 may be as follows: — *r* may be an office, the window serving also as an outside door, for the entrance

of persons on business belonging to the farm; *t*, a fruit-room and china-closet, or room for the use of the mistress; and *u*, a laundry. Fig. 754 may be the plan of the bed-room

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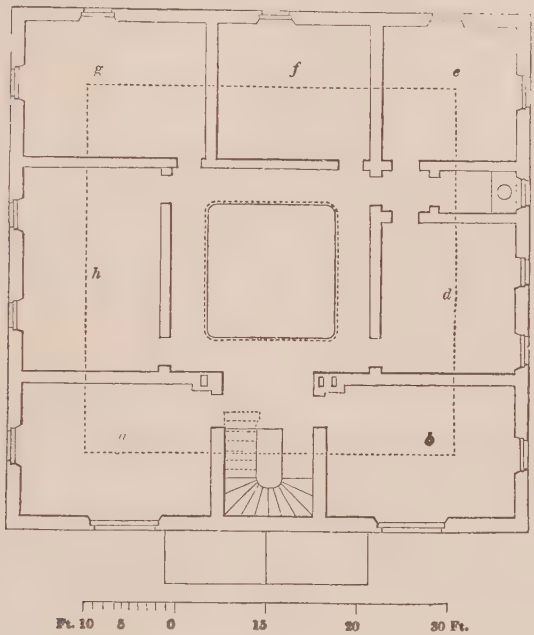

or garret floor, in which *a* is the room for female servants, and *b* that for single men; *d*, *e*, *f*, and *g* are bed-rooms for members of the family, or for strangers; and *h* is a lumber-room. The entrance to the two servants' rooms is from the landing of the staircase, in consequence of which they can go down stairs without disturbing the rest of the family; and the entrance to all the other bed-rooms is from the gallery, which is projected from the side walls of the dining-room, as shown in the section fig. 755. The

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gallery, the staircase, and also the dining-room below, may be amply lighted during the day from the four skylights, which lights have double sashes; viz., outside ones of the same slope as the roof, which slide the one over the other like those of a hot-house, with very small panes, as before described; and inside ones, which are perpendicular, and open like common sash windows. Both sashes may be worked from below by lines and pulleys. A lamp suspended in the centre of the dining-room will light it, the staircase, and the doors opening into all the other rooms, in the evening. For the sake of economy, the outer walls of the bed-rooms are kept low; but as they are larger in length and width,

there will be an ample volume of air in each for health. The whole of this house may be effectually heated by the oven and kitchen fires, without any others. An ironing stove may be placed in the laundry; for which purpose there may be a flue built in the stack which contains the kitchen flue. In this Design, and the preceding one, it will be observed that there are no passages; which is a great saving of room. The general appearance of this farm house may be as in fig. 756.

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742. *A Model Farm House for a small Farmer* has been given by Morel-Vindé, which we consider perfect in its kind, for a country where the chief material of construction is timber of a small size. No piece of wood, in constructing this Design, is longer than ten or twelve feet, or thicker, when squared, than six inches on the side. It is not intended that this wood shall be cut out of large trees, but that it shall be squared from young trees or branches; to the end that, in countries abounding with wood, it shall not cost more than that which is used for fuel. The walls are framed of timber, and the panels filled in, and covered with weather-boarding or plaster, outside, and lath and plaster inside. The cellar floor of this Design, fig. 757, contains two divisions, a bake-

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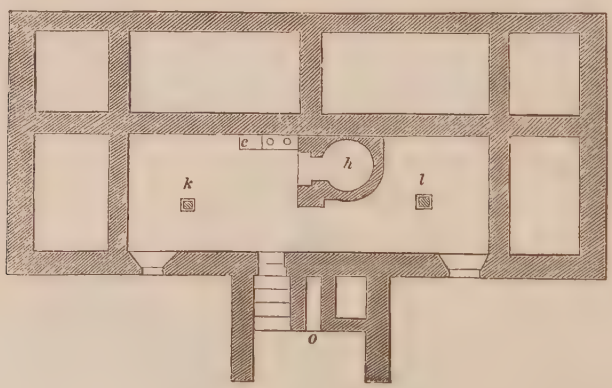

house, in which there is a stove, *c*, for heating the apartments above; an oven, *h*; and a supporting post for the parlour floor, *k*. The cellar has also a supporting post, *l*, and the entrance to both has six descending steps at *o*. The use of the two posts, *k* and *l*, is to admit of forming all the joists of the floor above of wood not longer than ten or twelve feet. Fig. 758 is the plan of the ground floor, in which may be seen the parlour, *a*, with a small office, *b*, and a bed for the master and mistress in a recess, *c*; the kitchen with its dresser, *i*, at one end of which there is a post, *k*, to support the floor above. In the centre of the building may be seen the stove funnel, *f*, with three small openings to the two bed-rooms, *h h*, and to the parlour, *a*; one of the bed-rooms containing two beds, *d d*, for children, and the other two for female servants, *e e*. In the mid wall may be seen at *g* the flue from the oven; and at one end the dairy, *m*, and the harness and small tool room, *n*: at the opposite end is a water-closet, *p*; and a house for wood and the larger farm implements, *q*. The entrance is by the ascending

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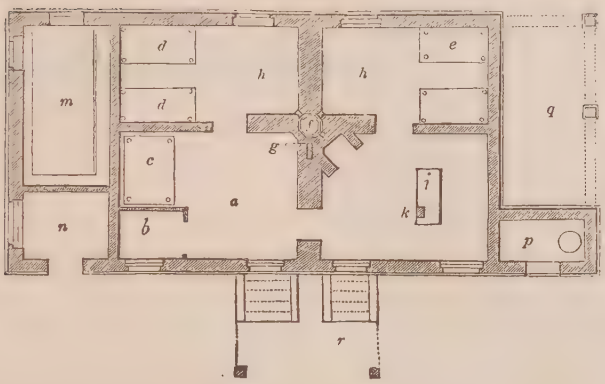

steps, *r*. The plan of the ceiling joists over this floor is represented in fig. 759. Over these joists there is a garret, which may be entered either from a staircase, formed in a porch behind, placed at *o*, in fig. 758, and corresponding with that in front; or by an outside ladder. On the supposition that it is entered by a ladder in front, its door is represented in the elevation, fig. 760, in which may be seen the two small windows to the bake-house and cellar; the doors of the harness-room and water-closet in the two wings; the entrance door of glass, the window to the kitchen, that to the parlour, and that to the cabinet or office. Fig. 761 is a side view, in which the projection of the porch is conspicuous at *s*, the window of the harness-room is seen at *t*, and of the dairy at *u*. Fig. 762 is a longitudinal section, in which the oven is seen at *h*, with its ash-pit underneath; the kitchen fireplace over it at *i*, the parlour at *k*, the garret at *l*, the ventilator to the dairy at *m*, and to the water-closet at *n*; and the doors to the two bed-rooms at *o o*. In fig. 763 we have given a perspective view of

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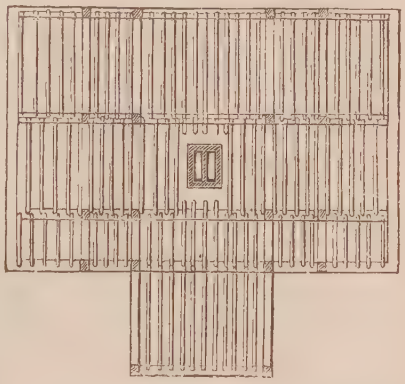

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this improved French farm house, varying the form of the chimney-tops; of the angle brackets of the porch; adding rails to the outside stair; giving a Gothic or old English character to the ventilators; and placing the whole on a platform. A further improvement

on the original Design is a glass window as a door to the garret, instead of the boarded one shown in fig. 760. This garret, instead of being entered by a ladder outside, might be got at by a trap-door in the ceiling of the kitchen, with a hanging ladder like that shown in fig. 158, § 179. The area covered by this building is 920 superficial feet; and it would cost, in the neighbourhood of Paris, £258 : 8*s.* : 4*d.*; but in the departments of France the expense would not be above half that sum.

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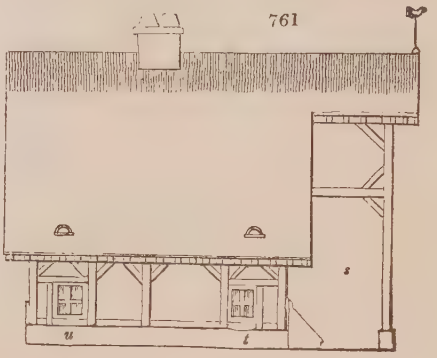

743. *On the Construction and Arrangement of this Design*, Morel-Vindé has the following remarks: — The post which, in fig. 758, is shown at *k*, as proceeding from the kitchen dresser, may be thought to be inconvenient, but it is not found to be so in practice; on the contrary, it serves as a standard to drive hooks or nails into, on which to hang things: at all events, its position there is essential to the solution of the problem of using

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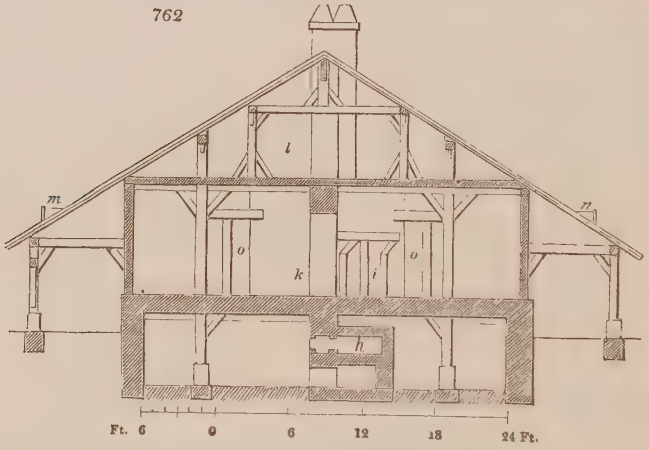

no wood in the whole building that is longer than ten or twelve feet. However, where wood is abundant, it might be avoided by substituting over it one strong and long beam,

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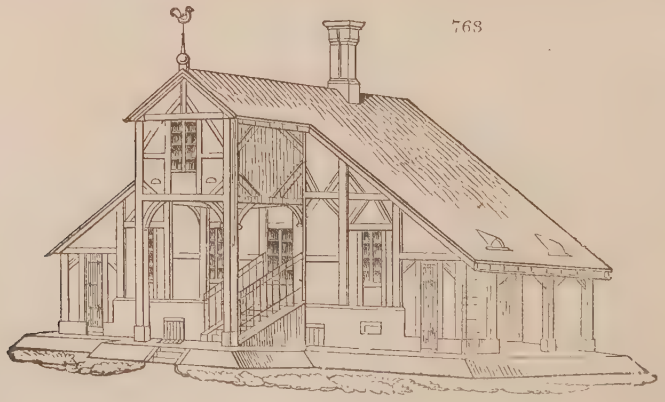

instead of two short joists. The privy or water-closet is thus constructed: — A tub, firmly held together by iron hoops, is sunk in the earth to the brim; and it has two strong hooks which project from each side. Over this tub is placed a portable seat, with a funnel, which descends into the tub, and there is a lid to the opening in the seat. All the soap suds, and other waste water of the house is poured through this funnel. Directly over the tub, in the rafters of the roof, a pulley is fixed; and, when the tub is full, which it will be once or twice every week, the portable seat is removed, and the tub is raised up and placed on a wheelbarrow, by means of a cord passed over the pulley. The tub is then wheeled away to two tanks, or small trenches; into one of which is poured the liquid matter, and into the other the more solid contents. The tub is then washed out, and returned to its place; and the liquid matter is immediately rendered thick by mixing with it powdered lime, chalk, or marl; or, in default of either of these, powdered lime rubbish. This manure is what is called in France *urate*. The thick matter the farmer allows to dry, and afterwards he reduces it to powder, when it forms that excellent and high-priced manure so well known throughout Europe, and especially in France, as *poudrette*. Finally, the *urate* and the *poudrette* are mixed together in a large tank, having the bottom and sides of masonry; and soap suds, or the liquor from stable dung, being added, the whole is worked till it becomes of the consistency of mud. After this, powdered plaster of Paris, or lime, or marl, is added, and thoroughly incorporated, till the whole is so thick that it can scarcely be stirred with a stick. Left to itself it soon sets, and in three weeks will have become so firm, that it will cut like cheese, and may be taken out and dried in lumps about twice the size of bricks. These bricks Morel-Vindé calls *stercorat*, and he says that they form as powerful a manure as pigeon dung. When used they are reduced to powder, and strewed over the soil by hand, as a top-dressing. In situations where neither plaster of Paris, lime, nor marl is to be had, the urate and poudrette may be mixed up with clay, when the stercorat is to be used on sandy soil, and with sand when it is to be used on clayey soil. This, Morel-Vindé says, is the best of all known manners of employing the contents of privies, and he speaks from long practice on his own estate, at Celle, near St. Cloud. (*Essai sur les Constructions Rurales Economiques*, &c., p. 26.)

SUBSECT. 2. *Fundamental Principles, Directions, and Model Designs, for the Construction and Arrangement of the various Parts which compose a Farmery.*

744. *The Parts which compose a Farmery* may be arranged under two heads, buildings and yards. The buildings may be classed as houses for lodging and feeding live stock; storehouses for produce and food; houses for preparing food, or carrying on in-door farmery operations; houses for portable machinery and implements; lodgings for single men, and houses for married men. The yards are chiefly two; the cattle or dung yard, and the rick or stack yard: but in large establishments there are, besides these, the pig yard, the poultry yard, the carpenter and smith's yard, and some others, according to the kind of farm.

745. *The Principles on which the Lodging-places of all domestic Animals are designed* must necessarily be drawn from the size of the animal, the temperature of its native climate, its habits of life, and the state of domestication to which it has been brought. The domestic quadrupeds which form the inmates of farmeries are chiefly the horse, the cow, the sheep, and the swine; and these, in their artificial state, may be considered as requiring the same climate, or nearly so; and as not differing very materially, either in the kind of food which they eat, or in their manner of taking it. They may all feed from a rack or manger, of nearly the same height relatively to their own; and, taken in the plan, or vertical profile, they are all more or less wedge-shaped; the head being placed at the narrow end of the wedge. The chief difference, therefore, is in their magnitude as wedges; and it is to ascertain this difference that the Architect who wishes to draw his practice from fundamental principles ought in the first place to direct his attention. A horse of average size, he will find, forms a wedge eight feet long, six feet and a half high; two feet broad at one end, and one foot and a half broad at the other. A cow or bullock of average size forms a shorter and somewhat blunter wedge than the horse; being generally seven feet and a half long, five feet high, two feet and a half broad at one end, and, allowing for the horns, nearly two feet at the other. Taking the horse and ox together, we may consider them, on the average, as wedges eight feet and a half long; two feet and a half at the broad end, and two feet at the other; and six feet and a half high. The sheep we may consider as three feet and a half long, two feet high, eighteen inches broad at one end, and, allowing for the horns of the ram, one foot at the other; and the swine may be considered as a wedge of the same size and shape as the sheep. Assuming these averages to be sufficiently correct for practice, two important conclusions may be drawn from them: first, that the most economical mode of lodging the first two of these quadrupeds must be in houses the walls of which form concentric

circles, or segments of circles parallel to each other; and that the rack or manger being required for the small end of the wedge, should always be placed against the smallest circle or segment; and, secondly, that in all open yards where quadrupeds are allowed to run loose, and eat from racks or mangers, the length of the rack or manger required to allow the whole to eat at once may be obtained with certainty when the kind of animal is given; since, when the rack or manger is to be in a straight line, the breadth of the broad end of the wedge must be allowed for each animal, and when it is to be curved, the radius of the curve must be determined by the breadth of the smaller end of the wedge. From this theory it may also be deduced, that there must be one magnitude, as well as one form, more economical than any other, for lodging each of these animals; and that this magnitude must be that circumference of a circle which the narrow ends of the wedges completely fill up, and no more. Fig. 764 shows the number of horses, or horned cattle, that will stand together in the circumference of a circle, with their heads towards the centre; and fig. 765 shows the parallelogram that would be required to contain the same number of the same-sized animals, supposing them to be placed in a straight line. Fig. 767 shows the number of average-sized sheep or swine that would stand in a circle; and fig. 768 the parallelogram that would be required to contain them in a straight line. The loss of space, in both instances, is about one fourth. It is true that, in practice, animals can never be placed so near together for any length of time; but the comparison which we have made sufficiently establishes the principle, that, in calculating the room required for lodging these animals, or feeding them from racks or mangers in open courts or yards, they must be considered as wedges. In applying this principle to practice, the habits of each animal, and the kind of food to be given to it, will form subordinate principles, which must also be taken into consideration by the Architect. We shall endeavour to illustrate this in the case of the animals above mentioned.

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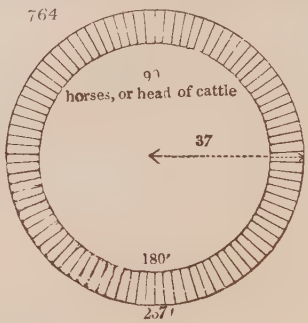

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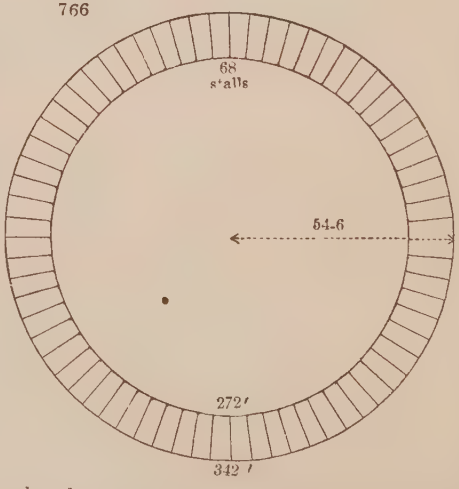

746. *The Horse and Ox* are capable of lying down and rising up, when they have a vacant space of a foot round them on every side. This will give a wedge-shaped stall, eleven feet long, five feet broad at one end, and four feet broad at the other; in which they will have ample accommodation, and the saving of room on each animal, in a stall of this description, as compared with a parallelogram stall, will be five and a half

superficial feet, or above one eighth part of the whole. The circular building best suited for this accommodation would have the radius of the inner wall fifty-four feet six inches, as in fig. 766; and, therefore, if (other circumstances being the same) stables or cattle-houses in farmeries could be built in this form as easily as in the parallelogram shape, there would be an obvious saving of space to the above extent; and this, in a stable of twelve horses, or a cattle-shed of twelve cows, would amount to sixty-six feet; or, in other words, more room would be gained than would be sufficient for an additional stall. Wherever curvilinear stables, or cattle-houses, therefore, can be introduced into a farmyard, the Architect may feel satisfied that the proper radius for the smaller circle, when the animals are of medium size, is fifty-four feet six inches.

747. *Sheep and Swine*, from the necessity of the former being kept in almost continual exercise, and being surrounded by, or at least having above them, a great abundance of fresh air, and from the restlessness of the latter, are never kept tied up in stalls; and therefore the curvilinear principle, as applied to them, refers only to the lineal direction of their mangers or troughs. Allowing a full-grown sheep or swine, when feeding at a rack, three inches on each side of his head, this will give fifteen feet nine inches as the best radius for the convex side of sheep racks, which are intended to be eaten from on one side only; and for the feeding-troughs of full-grown swine kept in a yard. This will be seen on inspecting fig. 769, in which the inner circle represents a trough or manger, out of which fifty-eight sheep or swine might eat on the outside, though not half that number within. As the difference is considerable between the width of a horned sheep and one without horns, this radius will require to be varied according to the proportion of horned to polled sheep in the flock.

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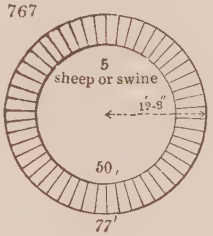

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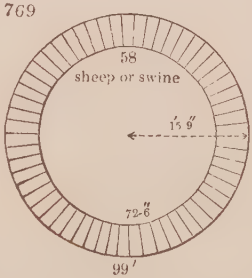


748. *These Principles* for the curvilinear arrangement of stalls, racks, and troughs, we do not lay down as of very great importance, but rather with a view to induce the young Architect to enquire into the reasons of things; and to endeavour, in every thing, to take principles into consideration rather than precedents. We shall now proceed to give details of, accompanied by reasons for, the more ordinary modes of constructing stables, cattle-sheds, and other buildings for animals which belong to a farmery.

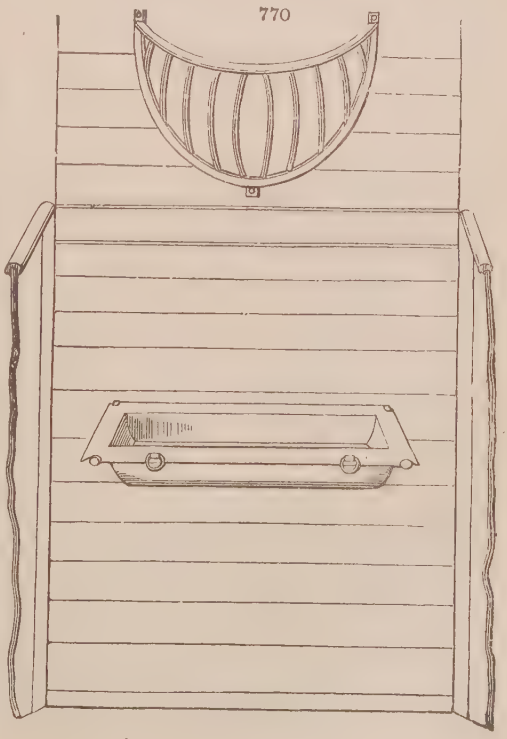
749. *The Buildings usually employed for lodging, feeding, or fattening Live Stock*, comprise the stable, cow-house, calf-house, cattle-stalls, hammels and sheds, sheep-house, piggery, poultry-house, rabbit-house, pigeon-house, and house for sick horses or cattle. These should either be connected together, and open into one yard, or they may be separated by the barn, and open into the same or different yards. On no account should they be intermixed with the implement and machine houses, or with the cart-sheds.

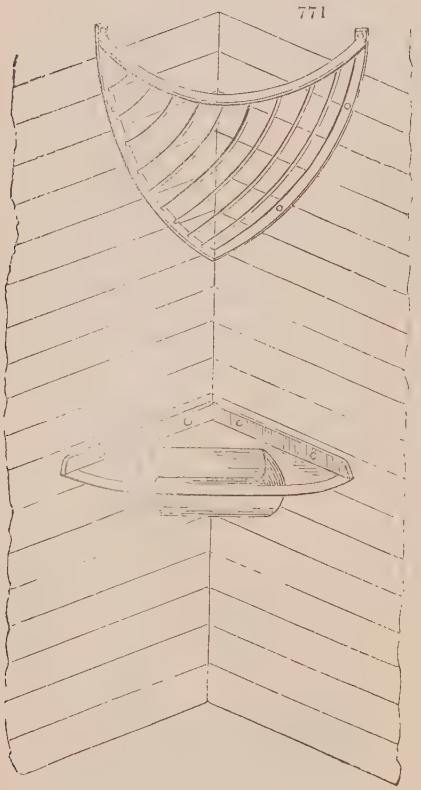
750. *Stables.* The horse is an animal in a highly artificial state, and requires to be treated with a degree of care beyond that bestowed on any other domesticated quadruped. The stable in which he is lodged should have its doors and windows to the south-east, as the mildest aspect, and, in general, have all its openings on one side, and in the roof, to prevent cross draughts of air. It ought to be on a dry soil, or, if on a wet one, it should be raised above it by a hollow floor; or by materials of a kind which will contain interstices of air between the natural surface and the artificial floor. All stables should be large, cool, and capable of being well ventilated. The proper temperature for a horse is 50° in winter and from 60° to 65° in summer. The best mode of ventilating a stable in winter is by trunks or tubes of boards, about a foot square, forming openings under the eaves, or carried up through the ceiling, where there is one, so as to pass through the roof; their tops being covered in such a manner as to exclude the rain, without impeding the ascent of the heated air. The inside openings of all these tubes

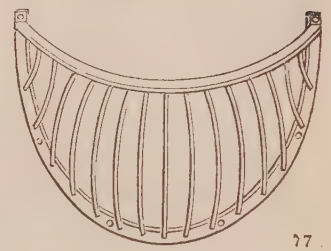
should have small sliding shutters to regulate the ventilation. In summer, this is best effected by having the windows filled in with hinged luffer-boards; or by having glass windows, with outside luffer-blinds. In the latter case, the quantity of air admitted, both in summer and winter, may be very accurately regulated by the degree to which the glass windows are opened. It was formerly supposed that darkness was favourable to good condition in horses; but this has been found to be a mistake, and light is now freely admitted, as well as fresh air. The floors of that part of stables in which the horses stand should be level; because, when raised towards the horse's head, they are found to put the back sinews on the stretch, and thus to fatigue the animal when he ought to be at rest. The urine may be carried off by a drain under each compartment, covered by a grating; and this grating where the horse stands loose, should extend from the centre of the compartment in four directions, like a right-angled cross. When the horse stands in a stall, in addition to the gutter behind, there ought to be a branch from it carried up the middle of each stall, a third part of its depth; and this, also, ought to be covered with a close grating of cast iron, or, as it generally is on the Continent, of oak pierced with holes. These cover gratings ought to fit into the tops of the gutters, so as to lie close and level with the adjoining floor, without requiring to be fixed, in order to admit of their being lifted out occasionally, for the purpose of cleaning out the gutter. This gutter should communicate with a covered liquid manure tank by a drain; or, if it communicates with an open tank, there ought to be a stink-trap in the drain immediately without the stable door, to prevent the entrance of a current of air through the grating, which air being necessarily saturated with the volatile alkali of the urine, would contaminate the atmosphere of the stable. The great advantage of this drain and grating is, that the evaporation of urine in the stable is in a great measure prevented by it; and not only its atmosphere rendered much more healthy, both for men and horses, but the whole of the ammonia of the urine is transferred safe to the manure tank, where it forms one of the most valuable portions of the manure. To get rid of this ammonia in the stable, all droppings from the horse should be removed immediately, if practicable; and, at all events, the litter which has been stained by the urine or the dung ought to be removed to the dung-pit, or to the outside of the stable, at least twice a day. It is the practice with some farmers to clean out their stables only once or twice a week; but the exhalations produced by such an accumulation of matter cause many diseases in the feet and legs; and the floor, by the unequal accumulation, being rendered uneven for the horse to stand on, he is strained and fatigued when in the stable, instead of being rested. The litter kept in a stable should be only such as is dry and sweet; and that taken out should be immediately put into the dung-pit, to prevent evaporation. The eminent veterinary surgeon Blaine observes, in an excellent article on the horse, in our *Encyclopædia of Agriculture* (2d edit. § 6706.), that horses should not stand on litter during the day; because, though it is thought to save their shoes, and even their feet, by preventing the uneven surface of the floor from hurting them, he affirms that it "holds the urine, injures the feet, and is very apt to encourage swelling at the heels." As stables are commonly constructed and managed, it is by no means desirable to have a hay-loft over them; unless this is floored in such a way as to prevent the dust and dirt from the hay from descending upon the horses, and the ammoniacal gas from ascending into the hay. Upright racks are preferred to racks which slope forwards, because the horse in drawing out the hay is less liable to get dust and hay-seeds in his eyes; but, if the best and most economical system of horse feeding were adopted, viz. cutting all the hay and fodder, and giving it to them well mixed with corn and pollard in their mangers; and if these mangers were watertight, and the hay and fodder, previously to cutting, sprinkled with a solution of salt and water, no racks whatever would be necessary. When the horse is tied up, the halter should be contrived to run in a groove in the manger post, or in a tube behind it, to prevent it from becoming entangled with his feet. Stalls should always be wide, and for single horses of full size not narrower than six feet, and at least eight feet deep. Stalls for two horses ought not to be less than ten feet wide and eight feet deep, unless the horses are under the middle size. These are the fundamental principles and rules on which all stables ought to be formed, when the health of the horse, and the prolongation of the working period of his existence, are the objects in view. We shall now show their application.

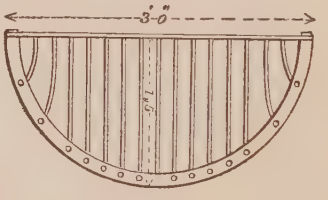
751. *The Stables* for farm buildings ought to be at least sixteen feet wide from wall to wall. The walls ought to be nine feet high; there ought to be no ceiling or floor over; and the width allowed for each horse should be at least five feet, whether they are separated by partitions or not. In stables without partitions, or with partitions of not more than three or four feet from the head wall, four feet six inches may suffice; but it has been observed that, when horses are crowded together, they do not lie down near so frequently as when they have ample space; and it has been further remarked that horses tied up in stalls do not lie down near so frequently as horses which are shut up

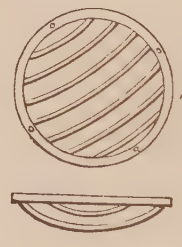
loose in separate compartments. When it is considered how much the health of almost all quadrupeds depends upon their reposing a portion of every twenty-four hours in a horizontal position, and more especially when we reflect that the horse is particularly liable to have swelled legs and heels, we cannot help being of opinion that all horses whatever ought to be lodged in separate cells or rooms, with divisions so high as to prevent them from seeing each other. We are informed by Waistell that some stables in the north of Yorkshire are divided in this manner, and that horses have been found to lie down in these stables, which would seldom do so when tied up with other horses, either with or without stalls. In several stables in Britain for hunters or riding horses, we have seen this practice adopted; and it is very general in the great breeding establishments known by the name of *des haras* (studs) in France. There is a very large stud of this kind in the neighbourhood of Nancy, which we visited in 1828; and where we found entire ranges of stabling partitioned off into separate cells for mares and foals, with a passage behind. The dimensions of these cells, as estimated by us on the spot, and marked down at the time, were about fifteen feet square; the partitions were of inch and a half boards, ten feet high, grooved and tongued into each other; and in the centre of the side next the passage was a doorway opening into it: this passage was at least six feet wide. These dimensions, being for mares with foals, are much more ample than would be required in farm stables: in these, eight or nine feet by twelve feet, the dimensions adopted in the north of Yorkshire, would be sufficient. It is well known that almost all hard-worked horses fail first in the legs and feet, and that the best way to alleviate this evil is to induce them to repose as much as possible in a reclining position. Now, since horses are found to lie down more readily in separate rooms than in stalls, there can be no doubt that, as a matter of economy, this mode of lodging them would repay a farmer for the extra-expense. This once proved by practical men in the best cultivated districts of Britain, such as East Lothian or Northumberland, for example, such stables would as soon be substituted there for those now in common use, as the threshing mill was fifty years ago for the flail, in the same districts. Whether the stable is laid out with stalls, or in separate compartments for single horses, there ought to be a broad passage behind, between the stalls or horse-rooms and the wall; which passage ought to be paved, and kept at all times dry, clean, and free from litter. In the wall there ought to be one or more windows, according to the size of the stable, for light and ventilation. Each window may contain two glass sashes, sliding past each other in grooves, and should have on the outside fixed luffer-boarding, or shutters of that description, either hinged, or also sliding in grooves. Under each window there should be a recess for a corn bin; or these may be placed at the extreme ends of the passage, or in the fodder-ing bay. There ought to be tubes under the eaves for ventilation, protected outside by luffer-boarding, and furnished with sliding shutters inside, for the purpose of regulation. There ought to be cupboards formed in recesses in the walls, one for each man who works a pair of horses, in which he may keep the currycombs, and other articles necessary for cleaning them. The harness of every horse that is in daily use ought to be hung against the wall behind it, in order to lose as little time as possible in taking it off and putting it on; and that which is only used occasionally should be kept











in the harness-room. There should be one or more lanterns, suspended by cords and pulleys from the roof over the passage, for putting lighted candles in, while feeding or cleaning the horses during winter. The racks, when placed on the floor, should occupy two thirds of the width of the stall or horse-room, and the manger ought to occupy the other third, its top being on a level with that of the rack; or the rack may occupy one angle, and the manger the other. The loft being condemned in farm stables, a place must be provided for holding food and litter: the most convenient is one or two divisions in every stable opposite its door, into which the food, whether green clover or tares in summer, or hay or roots in winter, can be readily carried from without, and easily distributed within. Being near the door, the food will be better ventilated than it could be in any other part of the stable, and it will occupy the least valuable part with reference to the horses; it being well known that in farm stables the horse which stands opposite to the door is more liable to take cold than any other. The corn bin or chest may also be kept in one of these divisions, and, in that case, should be so large as to have separate compartments for corn and beans, and for cut straw or hay, or bruised furze to mix with the corn or pulse. Stable doorways ought to be made four feet wide, and seven feet high; and the door ought to have no projecting latches or handles, because these are apt to hurt the horse, or become entangled with the harness. Racks and mangers are very frequently made of cast iron, and they are found much more durable and economical than wood, without any inconvenience being experienced from them. Fig. 770 is a cast-iron rack, two feet four inches long, one foot wide in the centre, and one foot four inches high. The bars are one inch and a half by five eighths of an inch in thickness, and two inches and a half apart; the whole weighs thirty pounds, and costs by retail 8*s.* 6*d.* Below it is seen a cast-iron manger, three feet long, one foot three inches wide, outside measure, at top, and eight inches deep. It weighs two quarters thirteen pounds, and costs 10*s.* 6*d.* Fig. 771 is a wrought-iron angle rack. The chord of the arc on each side is two feet eight inches; the surrounding frame is one inch and a half by a quarter of an inch;

the ribs are round iron rods five eighths of an inch in diameter; and the whole weighs twenty-four pounds and a quarter, and costs 6*s*. Below it is an angle manger of cast iron, which measures three feet in length in front, with a basin one foot seven inches long, one foot wide, and eight inches deep. It weighs two quarters twenty-three pounds, and costs 9*s*. Fig. 772 is a wrought-iron rack, three feet long, eighteen inches high, and eighteen inches wide. It weighs thirty pounds, and costs 6*s*. 6*d*. Fig. 773 is a cast-iron bull's-eye rack two feet and a half in diameter, which costs 7*s*. 6*d*. These iron racks are far more durable than wooden ones; and, about London at least, cost less.

752. *As an Example of a Stable with high Racks, Mangers, and partitioned Stalls,* constructed in the most approved manner, we refer to figs. 774 to 779. Fig. 774 is the

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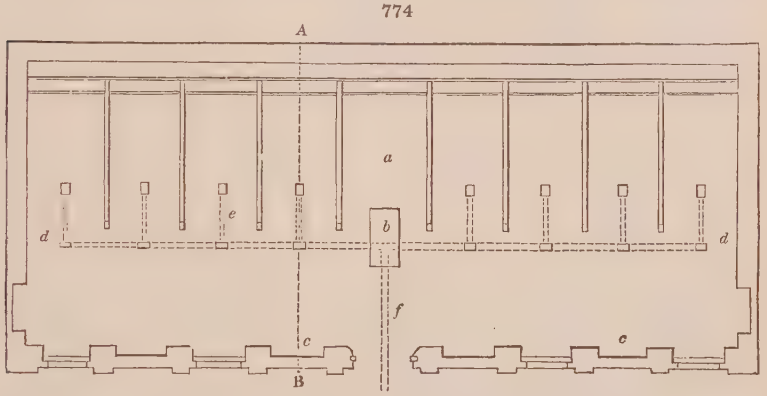

ground plan of a stable for eight horses, in which the racks are upright. In the centre there is a foddering bay, *a*; with a corn chest, *b*, placed on blocks of stone, to prevent its bottom from rotting; in the front walls there are recesses, *c c*, six inches or more deep, according to the kind of wall, for hanging harness in the upper part, and for pails and other articles used in the stable to stand in below. The recesses under the windows will allow of placing a small corn bin or cupboard there. The dotted lines from *d* to *d* represent the main gutter drain, and the short dotted lines from it, *e*, the branch drains into the different stalls; the dotted lines at *f* indicate a drain communicating with the liquid manure tank. The gratings placed over the main and stall gutters may be of stone or oak, pierced with holes; or of massive cast iron, like fig. 775, which, when twelve inches square, costs 4*s*.; when fifteen inches, 6*s*. 9*d*.; and when eighteen inches, 9*s*. 9*d*. Fig. 776 is a cross section on the line A B; in which is shown a ventilator in the roof, formed by a tube, with a stopper, *g*, sliding horizontally, continued up immediately under the roof, and opening in the ridge, under a protecting cover composed of two large slates, *h*; *i* is a cast-iron harness peg; *k* is the corn chest; *l*, the rack; *m*, the manger; *n*, the grating at the termination of the stall gutter; and *o*, the main gutter; *p*, the space under the rack, into which dust, seeds, and other matters from the hay or fodder drop down through the grated bottom of the rack, and are taken out, from time to time, by removing the bottom board in front. Fig. 777 is a front elevation of this stable, in a simple style, which may be called Grecian. Two of the windows are shown with outside blinds, and two glazed between upright bars, without horizontal ones, in the manner of hot-house sashes. The intention of this mode of glazing is to avoid collecting the moisture and dust which otherwise are always found on the cross bars of stable and out-house windows. All the windows are intended to have outside

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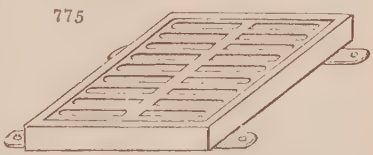

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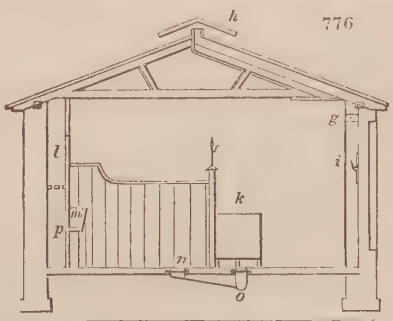

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luffer-board blinds, to be worked from the inside by a lever handle, in the manner which we shall describe hereafter. Fig. 778 is an elevation of the plan, fig. 774; supposing

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it to be finished exteriorly in a style which may be called Gothic. Fig. 779 is a cross section, in which is seen the small corn bin or cupboard for currycombs, &c., under the window, *q*; the ventilator, with its protecting cover, *r r*; the gutter drains with their gratings, *s*; the cast-iron manger, *t*; the bull's-eye cast-iron rack, *u*; the bottom of the rack, *v*, beneath which is the space for dust and seeds; a cast-iron ramped cap, *w*, to the partition between the stalls; and a cast-iron sill, with a groove for receiving the ends of the boards from the partition, *x*. The stable-post, *y*, in this section, is also of cast iron, and it costs 20*s*.; the ramped iron copings cost 12*s*. each, and the sills 7*s*. each. These cast-iron copings and sills for stalls are manufactured by Messrs. Cottam and Hallen; and they afford a very cheap, easy, and durable mode of forming the partitions between stalls.

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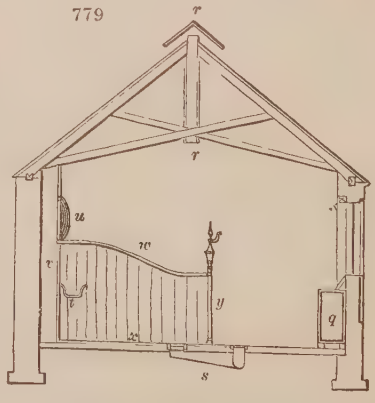

753. *The different Modes of arranging* the racks and mangers of stables are shown in figs. 780 to 785. Fig. 780 is a front view of the rack and manger, shown in the section fig. 776; and fig. 781 is a front view of the bull's-eye rack and cast-iron manger shown in fig. 779. Fig. 782, two corner cast-iron racks, and a cast-iron manger. Fig. 783 shows what is called a corner manger, with a standard corner cast-iron rack, which costs 10*s*. 6*d*., and of which fig. 786 is a perspective view. Fig. 784 is a standard rack, extending two thirds of the width of the stall, in which the horses or cattle are supposed to eat from the top when standing, and from the side when lying down. The length of the manger is one third of the stall, and the space under it is fitted in with spars, so as to form a continuation of the rack. The bottom of the rack is raised six inches from the floor, and is sparred somewhat closer than the sides; the top has cross spars, one foot apart, to prevent the animal from tossing the fodder out of the rack. Fig. 785 shows a cast-iron manger, and a projecting quarter circle rack; that is, the fourth part of a grated

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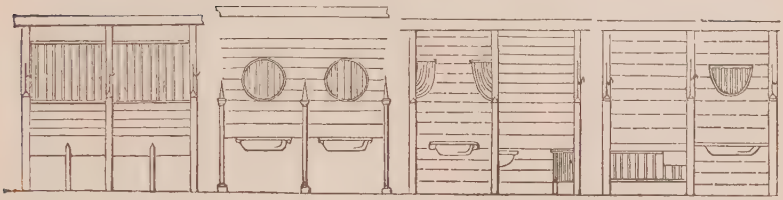

globe, open at top, for putting in the hay or other fodder. When the upright rack shown in fig. 780 is formed of wood, the staves or upright spars are one inch and a quarter square, or round, let into top and bottom rails, three inches and a half by two inches and a half. If the staves are square, they are mortised into these rails; and, if they are round, holes are bored in the rails, to admit their ends. The common width of the openings between the staves is two inches and a quarter; but large horses require three inches. The bottom of the rack is filled in with spars of the same dimensions as the staves of the rack, and at rather less distance from each other. The partitions between the stalls, when made of wood, are thus formed: — A strong post, called the heel-post, or stable-post, six inches square, and seven or eight feet long, so as to stand six feet high when the lower end is inserted in the ground, is firmly fixed by ramming round its lower end with earth and stones. Into this post two rails are mortised, the other ends of which are nailed to the uprights which support the rack, and against these rails upright boards an inch thick are nailed, and terminated by a capping piece, straight or ramped, according to taste. Short partitions, three or four feet long, and seven feet high, are sometimes formed between stalls, to prevent horses adjoining each other from eating together. The width of stalls with these short partitions, Waistell observes, may be about four feet and a half. Long partitions to stalls, he says, should be about eight feet; and the width of each stall, from five feet and a half to six feet. In some parts of the country, it would be cheaper to form the partitions of slate or flag-stone, or even of common rubblework; or of rammed earth, or of cob.

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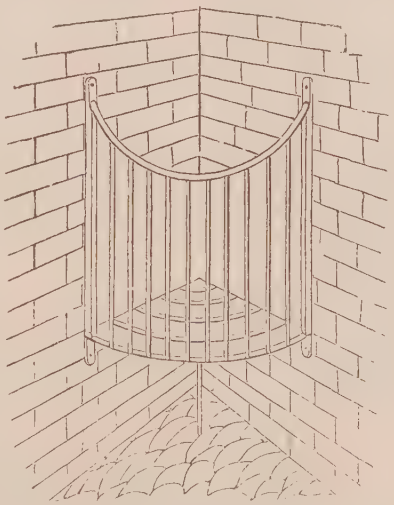

754. *The Window most suitable for Stables and Cow-houses*, we think, should be composed of glass within, and of luffer-boarded blinds, to serve also as shutters, without. The construction is shown in figs. 787 to 793. Fig. 788, to a scale of a quarter of an inch to a foot, is a view of the glass window, as seen inside the stable or cow-house. It is composed of two sashes, *a*, *b*, one of which slides past the other, in two grooves, in the top and bottom of the frame, as shown in the section fig. 787. These two sashes are without horizontal bars, and are glazed in the manner of hot-house windows, for the reasons before mentioned, § 752. At *c* is a mortise cut in the side style of the window frame, for a handle to move up and down in, which is used to work the outside blinds, and this handle can be locked by an iron pin, when the blinds are used as shutters. Fig. 789 is an outside view of the same window, with the blinds placed before it; the laths or luffer-boards being in a horizontal position, to admit the greatest quantity of light. Fig. 791 is a cross section of the window complete, with the luffer-blinds, *d*, outside, and the two sashes, *e*, inside. In this figure is seen the lever handle, *f*, which works the luffer-boards. In the knob of this handle there is a small hole, which (when the

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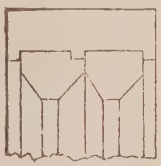

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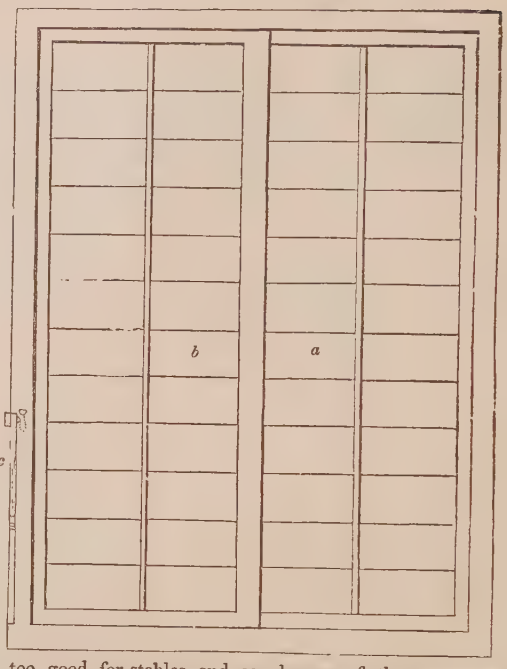
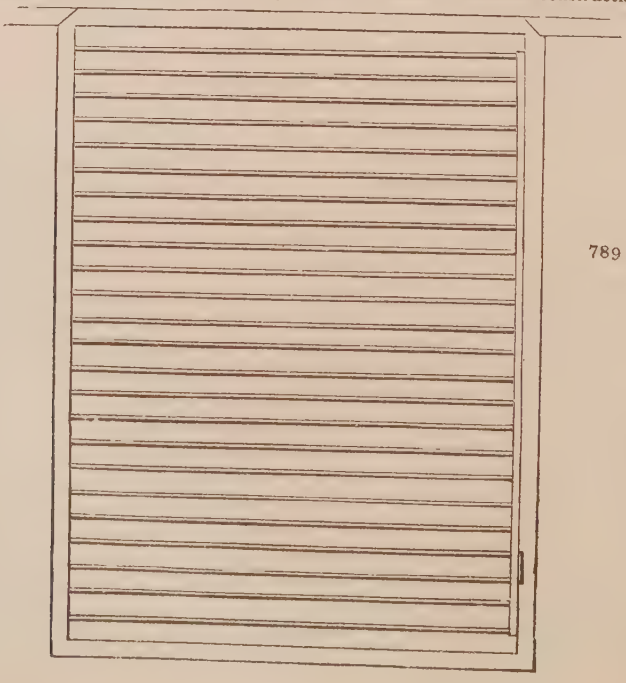


luffer-boards are shut close down, so as to admit the least quantity of light, and the handle is, in consequence, raised to *g*) necessarily coincides with the ring staple at *g*; when, by inserting an iron pin through the hole in the lever handle, and through this staple, the luffer-boarding is locked, and becomes a secure shutter. Fig. 790 is a view of a single lath or luffer-board, in the ends of which are seen the two small iron pivots or studs which work into the holes shown in the two lever rods, fig. 792. Fig. 793 is a fragment of the section fig. 791, on a large scale; in which are shown the luffer-boards locked, the lever handle, *h*, being at its highest point. These figures will be understood by any carpenter, if not by all our readers; and though windows and blinds of this description may be thought too good for stables and cow-houses of the commonest kind, yet, for amateurs, we have no hesitation in stating it to be our opinion, that they are far preferable to any others which have yet been invented. No other construction gives



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such command of light and darkness during the day, and of air at all times. In common farm stables, windows might be formed of broad luffer-boards, so hinged as to shut close when it was desirable to exclude air, and to open to different degrees according to the quantity of light or air, or both, which might be wanted. In these broad luffer-boards, there might be inserted one or two small panes of glass, for the purpose of admitting light in severe weather when it was not desirable to admit much air. On the whole, whatever description of window is used in a stable, it ought to be such as will when it is desirable, as in very cold weather, for example, admit light without air, and in very warm weather, in the day time, admit abundance of air without much light.

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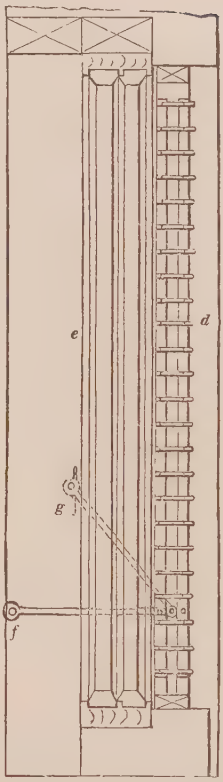

755. *As an Example of a Stable with Boxes as well as with Stalls*, such as is usually erected for gentlemen keeping hunters, we shall give the plan and other details of a Design sent us by Mr. Perry, and executed under his superintendence, for a gentleman in the neighbourhood of Godalming. Fig. 794, to a scale of one sixteenth of an inch to a foot, is the ground plan, in which *a b* are two-stalled stables, each seventeen feet by twelve feet six inches, and containing mangers, *c*, of the width of the stall, and quarter circle upright racks, *d*, in the angles of each stall. There is a common sash window to each stable, and near it an angle hay bin, *e*, formed of boards, with a lid, and capable of containing a truss of hay. The two-horse boxes, *f f*, are each twelve feet six inches by nine feet six inches, and have mangers, racks, and hay bins like the stables. There is an entrance lobby, *g*, with stairs to the rooms over, and this entrance has double doors, as appears by the elevation, fig. 795. Fig. 796 is a longitudinal section from A to B, in which are shown the partitions between the stalls, *h h*, the mangers, *i i*; the situation of the drains beneath, *k k*; and the openings in the exterior walls for ventilation, *l l*.

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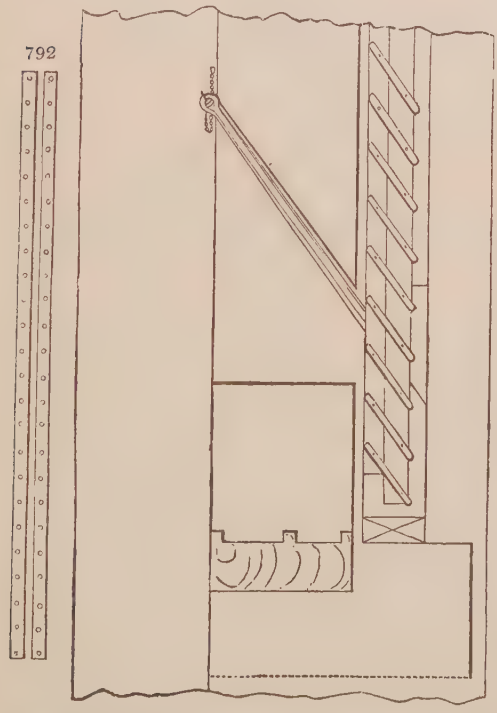
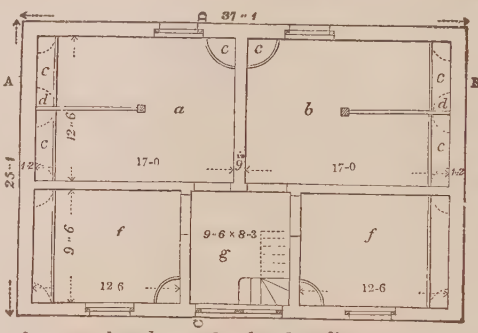
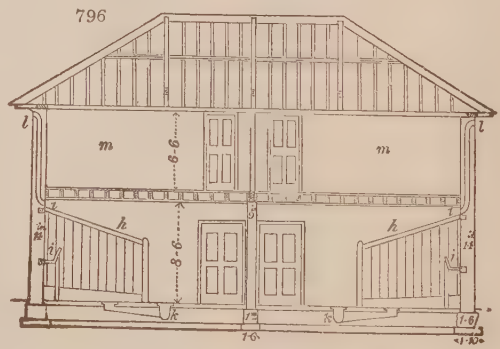


Above are two rooms for any convenient purpose, *m m*. Fig. 797 is a cross section on the line C D, in fig. 794, in which may be seen the mangers, *n n*; the racks, *o o*; and the

ventilators, *p p*. Fig. 798 is a plan of the flooring of the rooms over the stables, exhibiting the channels or grooves in the walls, for ventilation, *q q*; and the appearance of these openings exteriorly is indicated in the end elevation, fig. 799. Fig. 800, to a scale of two thirds of an inch to a foot, shows the manner of finishing the eaves of the roof; in which *r* is the principal rafter, eight inches by three inches at bottom, and six inches by three inches at top; *s*, the wall-plate; *t*, the pole-plate; *u*, the upper rafter; *v*, the eaves board; *w*, the slate boarding; *x*, the bracket; *y*, a bed-moulding; and *z*, the soffit boarding. The stalls in this stable have level floors and gratings similar to those in fig. 776, § 752; the floors of the boxes are also level, and paved with flag-stones, all of which, except about eighteen inches in width round the box, are perforated with holes about the fourth of an inch in diameter at top, and gradually widening to the under side of the stone, like the holes in the tiles of a malt kiln. The centre stone lifts up, for the purpose of cleaning out the drain below.



756. Houses for Horned Cattle. The anatomical structure and physiology of horned cattle are much less intricate than those of the horse; and the animals are consequently much hardier, and much less liable to disease. They will endure a greater degree of cold in winter, and of heat in summer; and they require less delicacy of management in their lodging, either in respect to space or ventilation, than horses. No horse could be kept in a stall for months, without exercise in the open air, and yet retain his health; but cattle have been so kept till they have been made sufficiently fat for the butcher; and milch cows have been kept in the neighbourhood of London, standing in the same stall, without having been once taken out, for two years. (*Encyc. of Agr.*, 2d edit. § 6898.) It does not follow from this, however, that great improvement might not be introduced into cow-houses and cattle-sheds; and that exercise in the open air would not add to the flavour and wholesomeness both of butcher's meat and dairy produce: on the contrary, the cow-houses in Holland, and the cattle hammels, or small feeding yards, of Northumberland, may be referred to as proofs that this is actually the case. The principal difference between a house in which cattle are tied up, and one in which horses are either kept in stalls or in separate rooms, is the open gutter behind, which has hitherto been considered indispensable in cattle-houses, on account of the more fluid nature of the dung of the animals. This gutter, or some substitute for it, is



certainly essential where cattle are tied up; and one of the principal points in the construction of the floor, in every house for horned cattle, is, to place the gutter at

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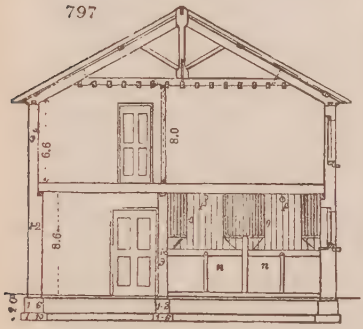

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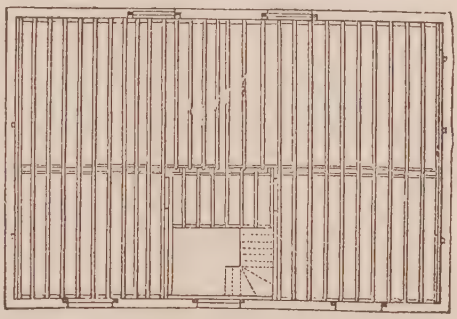
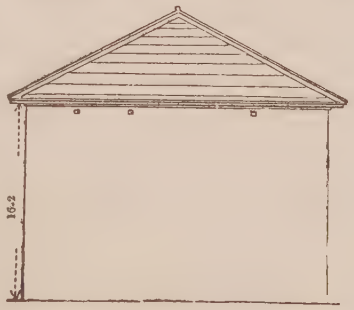


a proper distance from their hind feet. This distance, in Holland, is never less than six inches, nor more than a foot. The gutter is generally made a foot broad, and three or four inches deep; it is usually perpendicular on the sides, but sometimes the cross section of the gutter is that of a semicircle or semioval; which last form is, however, objectionable, as it is apt to make the cattle slip when they cross it to their stalls. Whatever be the form of the section of the gutter, the hoe or scraper employed to clean it out must have its blade of a corresponding shape. In houses where cows or cattle are kept untied, two or three are generally placed together in an apartment ten or twelve feet square, opening into a small yard of twice that area. Such cattle-houses are called, in Northumberland and Berwickshire, hammels; and in them there is no regular gutter, but simply a very gentle inclination of the floor of the shed and of the surface of the yard to one angle, where there are, or should be, a trap and drain, communicating with the liquid manure tank.



757. *Cow-houses*, in which cows are kept for giving milk, require to be constructed with more care than other cattle-houses, with respect to ventilation, light, and cleanliness. Cows on common farms are not generally kept in separate stalls, except in cases of sickness, or when they are near the period of calving. The width of a common farm cow-house, where the cows are to be ranged lengthwise of the building, should be at least sixteen feet, and the width allowed for each cow, of the largest and most improved breed of cattle, should not be less than five feet, or, when the cows are kept in-doors throughout the year, six feet; and the space from the manger to the gutter should be eight or nine

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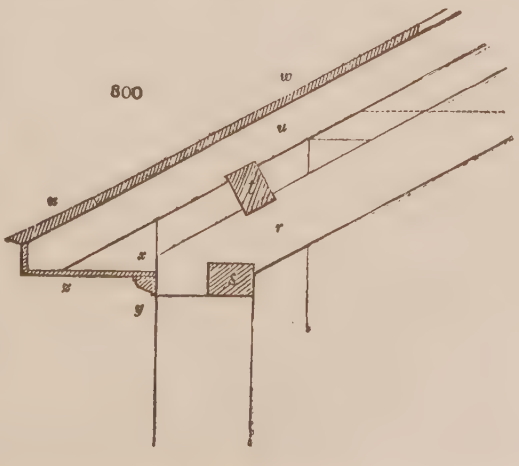

feet. The manger should be a boarded, stone, or iron trough, placed so that the upper edge may be from a foot to eighteen inches above the surface of the ground, or about the height of the cow's knees; and it may be eighteen inches broad, and a foot deep. It should be divided into three parts, to admit of putting dry food in one, moist food in another, and water in the middle. In default of this arrangement, there ought to be a division of the manger for water between every two cows. Where cows are not kept in separate stalls, there ought to be a partition between every two pair, to reach half-way or more to the gutter behind. Between the manger and the wall there should be a passage of at least three feet in width, for supplying food, and for cleaning out the mangers from time to time. The gutter behind the cattle should be at least a foot wide; and this will leave a passage, between the gutter and the wall, of three feet in width. There ought to be a door in one end of the foddering passage; and, another as an entrance for the cows, in the end of the broad passage. The food may either be kept in an empty stall next the door, or, what is preferable, in a foddering bay, into which the doors should open. In every cow-house there should be windows for light; and there ought to be tubes for ventilation in the side walls, or in the roof, similar to those recommended for stables, to use when the windows cannot be conveniently opened. The cows may be fastened to the front rail of the manger by a halter or chain passed through an iron ring, and loaded at its lower end. The floor of the standing-room ought to be perfectly level, because it is found that, when it is lower towards the gutter than at the manger, it is apt to occasion abortion, when the cows are in a gravid state; and, for the same reason, the top of the manger or rack, if there is one, should never be higher above the floor than eighteen inches. Morel-Vindé observes that the farmers of Normandy are so particular in this respect, that they not only have their mangers and racks very low, but, when the cows are turned out to grass, they always harness them with a bridle and brechin (bricole Normande), in such a manner as to prevent them from tossing up their heads, or reaching to the branches of trees.

758. *A cow-house in which the cows are to stand across the building* will afford the same accommodation as that in which they stand with their heads against one of the side walls, at less expense of walling; because the foddering bay, which need not be larger in this case than in the other, serves at the same time as a foddering passage. In these foddering bays Waistell recommends that a cistern should be constructed, in order that when the turnips are topped and tailed in the field, the cart which brings them home may be backed into the bay, and the turnips tilted into the cistern, where, by stirring them a little, the loose earth which adheres to them will readily drop off, and they may be taken out of the cistern, and supplied as wanted to the mangers. This operation is performed by means of a grated iron scoop with a long handle.

759. *In the cow-houses of landed proprietors of taste,* or in those of large establishments near town, various improvements may be suggested on the above arrangements. One of these is, to have a drain covered with oak planks pierced with holes or cast-iron grates along the bottom of the gutter, for the purpose of allowing the urine and thin dung to pass immediately through it, and be carried off, as was practised in the Harleian dairy, near Glasgow; thus diminishing smell and evaporation, and presenting at all times an appearance of cleanliness. The gutter, in this case, may be very shallow; and, indeed, if a broom be now and then passed over the grating, so as to press all the dung into it, it might be raised to a level with the floor, and the open gutter entirely dispensed with. Grated bottoms to gutters, with drains underneath, are common in the cow-houses of men of wealth in France and Germany; where there is sometimes, as in the king of Wirtemberg's dairy at Weill, a supply of water at one end of the gutter, always ready to be turned on by a cock, every time it is cleaned. This is the case also in the cow-houses of the Agricultural Institution at Schleissheim; and it is found there not only to keep the gutters sweet, but, by the obvious increase it affords of fluid matter in the manure tank, to supply the means of rotting a greater quantity of straw in the dunghill which is there kept over it, and moistened with the fluid beneath by means of a pump. Another improvement is, having all the divisions in the manger, intended for water, on the same level, by which means they may be simultaneously supplied by turning a cock; or the same thing may be accomplished, if they are on a uniform slope, by sinking them six or eight inches below the general surface of the bottom of the manger, and having a false bottom, or water channel, leading from one to another. In this case, after the first division was filled, the water would run along the false bottom or water channel and under that of the dry and moist food divisions of the manger, to the next water division, and so on to the end. It must be confessed, however, that supplying cattle with water in this way is a refinement that can only be worthy of adoption in very extensive establishments; for cattle, like all other animals, when regularly fed, and properly treated, will only drink at stated periods after they have had their due supply of solid food, and at these periods they could be let out to drink in the

open air Water is supplied in the manner above mentioned at Rhodes's dairy, at Islington (see *Encyc. of Agric.*, 2d edit. § 6897.), where one division for water is formed in the manger between every two cows; and these divisions are furnished with covers, which are put on when the cattle are eating dry food, to prevent them dropping any of it into the water, and thus dirtying it. As abundance of light in every farm building is highly favourable to cleanliness by exposing the want of it, large glass windows might be formed in every description of house for cattle; but these should always be provided with outside shutters; or, what is preferable, luffer-boarded outside blinds, as recommended for stables, fig. 789, § 754, to keep off the intensity of the light, and also the heat of the sun. These shutters or blinds should be opened whenever the master or mistress may enter the building, or when it is to be cleaned out; but at other times they should generally be closed, as it must not be forgotten that light stimulates the animals, and prevents their repose, while it favours the introduction of flies and other insects, which are always very troublesome to cattle. In the royal cow-houses at Bagatelle and at Villeneuve d'Etang, near Paris, the windows reach from the floor to the ceiling, and open like those of a drawing-room. They have outside shutter blinds, and hinged panes of glass at top and bottom, for giving air in the winter season. The walls and ceilings are plastered, and finished as carefully as those of a common dwelling-house in London; and a person being constantly in attendance to remove any dung that drops, the place is as clean and sweet as can be desired. We speak of them as they appeared to us when we visited them in 1828. In Flanders the cow-houses are equally clean and sweet; and Radcliffe, in his *Husbandry of Flanders*, informs us that, in the winter season, the farmers generally breakfast in them: he adds that he did so himself, and found no inconvenience from either bad smells or want of cleanliness. In general, indeed, cow-houses and cattle-houses, as well as the animals themselves, are kept far cleaner and wholesomer on the Continent than in Britain. In the Harleian dairy establishment, which existed some years ago at Glasgow, some ingenious contrivances for cleanliness were introduced, which may deserve imitation. In front of each cow, between the manger and the foddering passage, a wire grating was suspended by cords and pulleys like a window-sash, which was lifted up when food was given, or the mangers cleaned out. The racks for hay were also suspended by cords, weights, and pulleys; so that they could be pushed up out of the reach of the cows, when moist food was put into the mangers. In the gutters there were round apertures, of about six inches in diameter, with cast-iron covers fitted to them at short distances, and through these the dung was swept into large drains below, whence it was carried away by its fluidity to a dung-pit. The tails of the cows were tied up to the ceiling at milking time, as in Holland, and they were regularly combed and brushed twice every day. A stream of water could be introduced into the mangers and gutters at pleasure, for the purpose of cleaning them, or for supplying water to the cattle to drink. No litter was used, but the floors of the stalls were formed of boards, and the gutters behind were furnished with grated bottoms, and openings with covers, at intervals, as before mentioned. The temperature of these cow-houses was regulated by a thermometer. We cannot approve of this plan of not littering the cows, which is still adopted in some of the large dairies near London; because it must be more comfortable to the cattle to lie down on straw than on bare boards or pavement, however smooth or clean either may be. Much less can we approve of the plan of not turning cows out of doors at least once or twice a day for exercise: this is always done on the Continent, even in the winter season, unless during a heavy fall of snow, or during continued heavy rain. Cows are universally cleaned like horses in Holland and the Netherlands, and in all the first dairies both in France and Germany; and the Continental custom of tying up their tails at milking time, already mentioned as practised by Harley, is beginning to meet with imitators in this country. Curry-combing and brushing have long been in use in gentlemen's dairies. We mention these things with a view of supplying the young Architect with ideas for the introduction of these and still further improvements in the design and construction of this kind of buildings; since no Architect can improve the arrangements of a building, of which he does not thoroughly understand the use; and the mere improvement of its Architecture, or external effect, without adding to its utility, is calculated to excite a feeling of contempt, rather than of approbation or respect.

760. *Calf-houses* ought to be placed near the cow-houses, to lessen the labour of carrying the milk to them; but they ought never to be so near as to permit the cow to see or even hear the calf; because either would disquiet her, and prevent her from feeding. The best mode is to have a separate house for the calves, and to tie them up to stakes like cows. The width of the space allotted for the calves need not be more than eight feet, and it should be arranged in every respect like a cow-house in miniature. Where calves are to be fed for the butcher, they are sometimes enclosed singly in

small pens, between six and seven feet square; but this is an unnecessary expense when the object is simply to rear the calf. In general, no arrangement is advisable by which two or more calves are kept loose in the same pen; because, so placed, they are apt to suck one another, and also because milk or food cannot be given to more than one calf at a time, and the others are liable to be injured while being driven off. As calves require the greatest attention to keep them clean, all the architectural arrangements connected with them ought to be especially directed to that end. The best constructed calf-pens in Middlesex have false bottoms of boards pierced with holes, through which all moisture escapes, by which means they are kept quite dry; and, by a little care on the part of the attendant, they may also be kept perfectly clean and sweet.

761. *Feeding-sheds for horned Cattle* may be constructed on the same plan as cow-houses, and the cattle placed in pairs between wooden, stone, or slate partitions. The cattle may either be ranged along the side walls, with a foddering passage at their heads, and a cleaning passage behind (the foddering bay being at one end, or at both ends); or they may be ranged across the building, with bays for holding fodder, or serving as passages for supplying it, alternating between every two rows of cattle. A house sixteen feet wide and twenty-eight feet long will contain eight head of average-sized cattle, in a row, with their heads to a foddering passage three feet wide, at one of the side walls; and with a cleaning passage four feet wide behind them. A house thirty-two feet long and fourteen feet wide will contain the same number of cattle, with their heads towards a foddering bay, and place for giving fodder in the middle of the house, eight feet wide. This last mode of placing the cattle is much more convenient than the other, and though it contains four feet more of circumferential walling, yet, if we make allowance, in the former case, for a building to contain the fodder, the latter will be much the more economical as well as the more convenient mode.

762. *Feeding-houses for loose Cattle.* It has been found that many descriptions of cattle, and particularly those bred up in mountainous districts, which are naturally small and active, do not fatten so well when tied up in stalls, as when left loose in a limited space, with a well-littered house or shed to take shelter in at pleasure. This is the general practice in Northumberland, and in most parts of Scotland. The sheds or houses may be fifteen or sixteen feet square, and fitted up with racks, either at the angles or against the partitions. The open yards may be of the same size as the covered sheds, with walls four feet high, and doors lifting out of grooves; or in two parts, with the upper half hinged, and the lower part fitted in a groove, so as to lift out. The reason why it is proposed to fit the doors in grooves, or to have them in two parts with the lower part grooved, is, that, in opening doors hinged in the common manner, they are apt to be obstructed by the litter which generally, though improperly, covers every farm-yard passage. In some Scotch farmeries, not only the doors of hammels and pigsties lift out of grooves, but even the gates lift out in a similar manner, or are suspended by weights with cords and pulleys, and are raised up and lowered like common sash windows. All this is owing to the practice of keeping yards covered with litter; but, when the management of cattle and manure is properly understood, the former will always be kept in houses or hammels, in order to moderate temperature; and dung and litter always under a roof, in order to lessen evaporation.

763. *Feeding-places for growing Cattle* are nothing more than open sheds fitted up with racks, each having a court or yard of proportionate size to the shed; that is, containing three or four times its area. In general it is desirable to divide these yards or sheds, so that not more than six or eight head of cattle may be together in the same yard. Besides the rack in the shed, there ought to be fixed or portable racks, with roofs to them, in the open yard. All cattle-racks ought to be placed on the ground: their height need not exceed two feet and a half, and their width eighteen inches. The top should have cross bars eighteen inches apart, to prevent the cattle from tossing out the fodder, and the bottom should be grated, to allow reeds, stones, dust, or other matter to drop through on the ground.

764. *Houses for working Oxen* may either be fitted up like the cow-houses, or, what is preferable, like the cattle hammels; a pair of oxen being allowed for each hammel. Whether oxen are kept loose in hammels or tied up in stalls, provision ought to be made under cover, and near them, for hanging up their harness; and for keeping the curry-combs and other instruments or utensils with which they are cleaned or fed. As it requires two pair of oxen to do the work of one pair of horses, on a farm where the ox is the principal beast of labour, a proportionate increase of building is required; and, in general, also an additional labourer for every three or four pair, for the purpose of cleaning them, and their stalls, harness, &c.

765. *Piggeries.* The swine is an inhabitant of all climates, and eats every kind of food; but he is nevertheless averse from extremes of either cold or heat. Nature has taught him, in a wild state, in the torrid as well as in the frigid zone, to seek the recesses

of the forest, both for food and shelter; where, while grubbing up the soil for roots, he is protected, by an impenetrable non-conducting mass of branches and foliage, from the heat of the one or the cold of the other. The domestic swine is in a highly artificial state, and requires to be kept warm by abundance of dry litter in the winter; and cool, by shady well ventilated houses or sties in summer. Seeking his food chiefly in the soil, he cannot be considered a delicate animal; and he has few diseases compared with either the cow or the horse. Uniformity of temperature, therefore, seems to be the chief thing to be studied in the construction of piggeries. As pigs are generally fed in great part with refuse from the kitchen and dairy, the piggeries should be so placed in a farmery as to be accessible from the offices of the dwelling-house, without passing through any of the straw yards, and at the same time not so near as to prove an annoyance in summer by their smell. The construction of piggeries is exceedingly simple, each pigsty consisting of a covered lodging, and a small open court; the latter for feeding and the former for sleeping in, in the case of store pigs; though, for fattening pigs, especially in winter, the feeding troughs are frequently placed in the covered or warmest part of the structure. In a complete piggery for fattening pigs, there should be, at one end, or in the middle, a bay or compartment for pig's food dry and moist; and on the two sides of a passage may be placed rows of separate sties; each with its feeding-trough in the side next the passage, and with a swing-door on the opposite side to a small yard. The use of the swing door, which is nothing more than a frame of boards suspended from a rail, the ends of which move in sockets freely either way between the jambs of the door, is to prevent the door from ever being left open in severe weather. When the pig wishes to go out, he soon learns to push it before him; and the same when he wishes to return. Fig. 801 is a section across a wall containing a pig's trough in which *a* is a swinging flap or door; *b b*, stops to prevent it from being pushed too far either way; and *c c*, holes for a bolt to fix it in the position *d*, when the troughs are to be filled with food, or to be cleaned; or at *e*, when the pigs are to eat. The pigs, however, will keep the flap open themselves while eating. This arrangement is well calculated for fattening pigs, when there is not more than one in a sty; but for store pigs, or for a sow with a litter, it is desirable to have a longer trough, or to have two or more small troughs, as the strongest pig is apt to get into the trough while eating, to the exclusion of the others. The floors of all pigsties should have an inclination to carry the moisture to a trap or drain; and no animal requires a greater abundance of dry litter. If under a good roof, and well supplied with this material, the pig will keep himself warm and comfortable, almost any where, and in any season.

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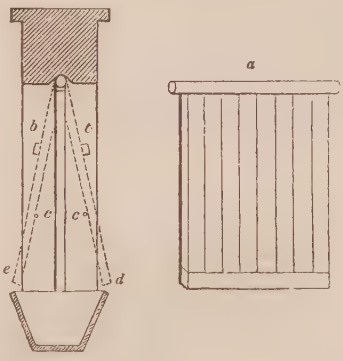

766. *Sheep-houses.* The sheep is a native of temperate climates, where the ground is not long covered with snow during winter; but it has become an artificial inhabitant of all countries from Iceland to the equator. It is only in those countries where it cannot pasture in the open air, from the snow covering the ground during some weeks at a time, or where the extreme heat of summer burns up the herbage, that sheep-houses ought to be required. There are, however, other cases, in which, from the imperfect state of agriculture, and the absence of fences to the fields, or from imperfect civilisation, or the want of rural police, and the consequent prevalence of thieves and wolves, sheep-houses become necessary for protecting the sheep during the night. Structures of this kind are common in Russia, to prevent the sheep from being famished during the long winters of that country; and in France they abound as nightly shelters to guard them from the wolves. In Britain, folds, or walled enclosures, are almost the only description of sheep-houses in use; because our sheep can pasture in the open air during every month in the year, and all our fields are enclosed by hedges, walls, or other barriers. In some of the mountainous districts it becomes necessary to protect and feed the sheep during severe storms; and this is done in Scotland by square or circular folds, called stells, into which the sheep are driven and fed. Sometimes these stells are roofed in, but in general they are left open. The sheep-houses of France and Germany are simply roofs supported by posts, and covering a space sometimes open on all sides, but generally closed to the height of six or seven feet. Across, or lengthwise, in this space, hay-racks are placed;

and, instead of side and end walls of masonry, there are generally wooden pales. The roofs are made very high and steep, in order to acquire strength to bear, and inclination sufficient for throwing off the snow, at the least possible expense of timber. As there is no objection to numerous posts within, provided they be in the line of the racks, sheep-houses of the largest dimensions may be constructed of pieces of timber not more than ten or twelve feet long, or thicker than six inches. Sheep-houses, or folds for feeding and housing sheep in bad weather, are, in England, Mr. Main observes, "square enclosures erected in sheltered places, formed of an outside wall built of turves or other materials, about six or seven feet high; and all round the interior are lean-to thatched sheds, supported on posts about four feet high. Against the back wall are racks for hay, and troughs for chaff, bran, oats, or peas, &c. The middle of the fold is kept well littered with straw; and on one side of the gate there is a lock-up shed for keeping the provender. These folds are usually about fifty feet square, and are no less serviceable to the flock in bad weather, than to the farm in making great quantities of excellent manure." In the north of Germany, and in Poland and Lithuania, there are immense sheep-houses of a very simple construction, which nevertheless are exceedingly effective. A skeleton roof, sometimes circular and sometimes oblong, is formed of long poles, chiefly young spruce fir trees, with their lower ends inserted in the ground, and their points meeting at top; across these, smaller poles are fastened, not by nails or wooden pins, but by withy ties. The whole is then covered, or thatched with branches of spruce fir. The doors and places for ventilation are merely gaps, stopped up or opened according to the discretion of the shepherd. These sheep-houses answer their purpose perfectly. They are sometimes also used for sheltering cattle.

767. *The Sheep-house at Celle, near St. Cloud*, may be given as one of the most complete in France. It was erected in 1809, by Morel-Vindé, on his own estate, and the plan published fourteen years afterwards, as of a construction which, during that period, had given entire satisfaction. Long experience has convinced Morel-Vindé that every sheep in lamb, or with a lamb, to be at its ease, ought to occupy a superficies of ten square feet; that every full-grown sheep without a lamb requires a space of six feet; that every ewe requires a length along the edge of the rack and manger of one foot, in order to eat at ease; and that every ram with horns requires fifteen inches along the rack; that the racks are best when portable, that is, when they are capable of being taken down from the posts on which they are hung, as shown in fig. 802; and, lastly, that in no case should

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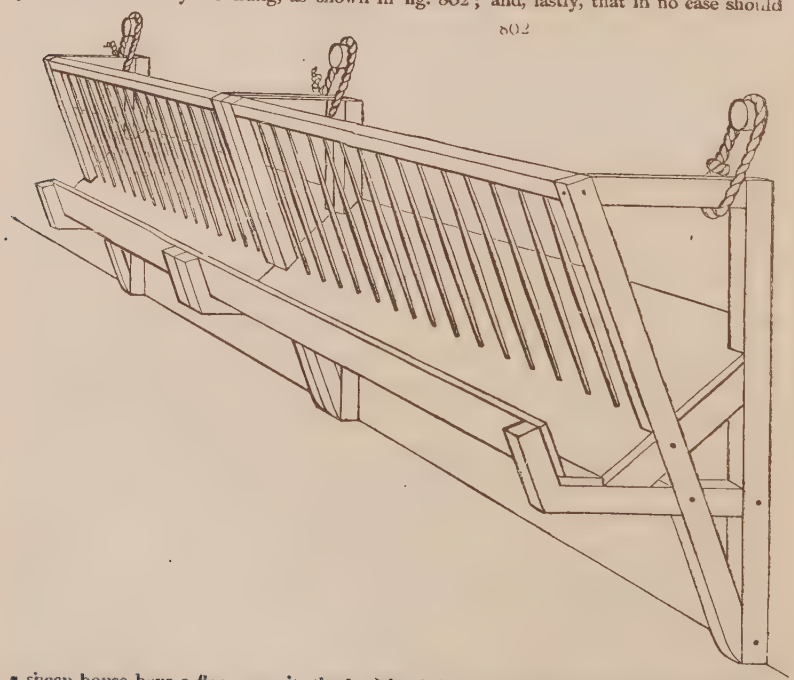

a sheep-house have a floor over it, the health of the sheep depending essentially on their having a great height of open space over them. On these fundamental principles the

sheep-house at Celle was designed. Fig 803 shows the ground plan, in which *a a a a* are double racks and mangers, like that shown in fig. 802, placed lengthwise in the

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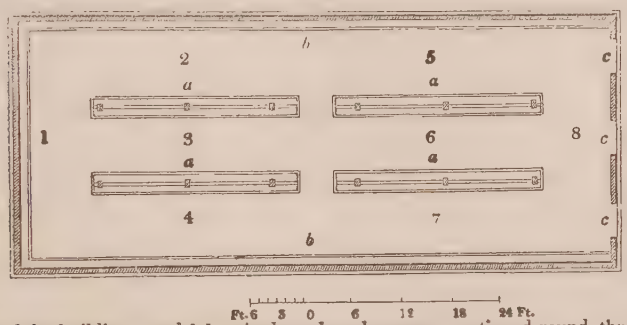

middle of the building; and *b b* a single rack and manger, continued round three sides. There are three doors at one end, *c c c*. These doors may be seen shut in the elevation, fig. 804; and the double and single racks may be seen in the cross section, fig. 805;

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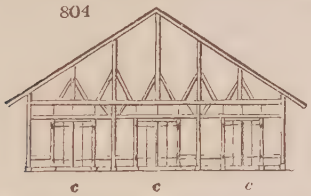

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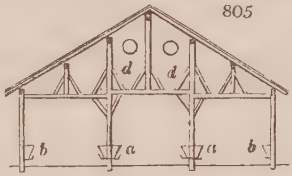

in this section, also, are seen two bull's-eye openings, *d d*, in the end, for ventilation, and which are kept open at all times. Fig. 806 is the side elevation, in which are shown the situation of small sliding shutters, immediately under the eaves, at *e e*, and that of small

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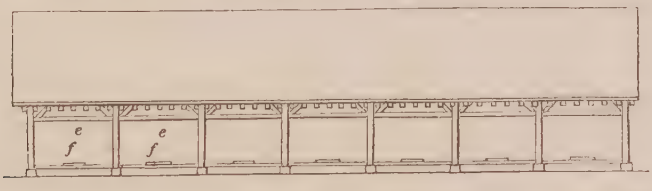

openings close to the ground, at *f f*, which have also sliding shutters, and which are for the purpose of establishing a current of air on a level with the soil. Fig. 807 is a

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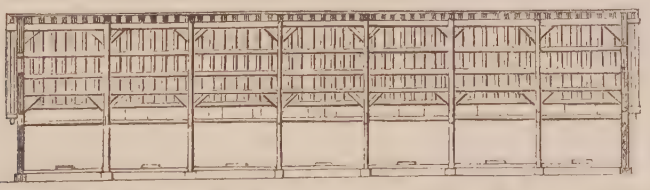

longitudinal section, showing the framing of the roof. The dimensions of this sheep-house are thirty feet in width, and seventy feet in length; giving, exclusive of the space occupied by the racks, eight parallelograms, marked from 1 to 8, in fig. 803, each thirty feet by ten feet, and each containing sufficient room for thirty sheep in lamb, or fifty without lambs. The racks cover a space of 370 superficial feet, exclusive of the 24,000 feet devoted to the sheep. The great merit of this structure is its economy; it having cost only £117 : 10s., which was mainly owing to the circumstance of its construction requiring only short pieces of wood; none of these exceeding twelve feet, or measuring

more than six inches on the side, as before mentioned. In France, wood when does not exceed these dimensions sells at the same price as firewood.

768. *Goat-houses* are not in use in Britain; but in France the celebrated manufacturer, M. Ternaux, who introduced the Cachemire goat from Persia, keeps them in his grounds at St. Ouen, near Paris, in the same description of houses as he does his sheep. In similar houses deer might also be kept.

769. *Rabbits* may be kept in any dry house. Sometimes they are allowed to run at large on the floor, and a range of boxes, eighteen inches high, and two feet broad, is placed round it, at the foot of the walls, divided into compartments of two or three feet in length, with one small door, a foot high and six inches wide, to each. On other occasions, where there is a scarcity of room, or where rabbits are to be fed, they are kept in tiers of boxes, one above another, called hutches. Each box or hutch, in this case, has a grated front, and behind, or at one side, an inner box or division, for the animal to enter and repose. The size of this inner box may be a foot by eighteen inches, and eighteen inches high; and the size of the open part of the box may be a cube of eighteen inches. The bars or spokes in front may be an inch square, and two inches apart. Two of them ought to take out, for the purpose of putting in food, &c.

770. *Poultry-houses* require no particular form or magnitude; because, the animal being small in size, there is no necessity for accommodating the shape of the house to its particular figure. Both terrestrial and aquatic poultry agree in requiring a dry and rather warm lodging; and they differ, in that the web-footed birds all roost on a flat surface, while gallinaceous fowls roost best at some height from the ground, on roundish horizontal rods or rails, of a size suitable for being grasped by their claws, but neither perfectly round nor perfectly smooth. All fowls, when in a state of incubation, require repose, to which darkness is favourable as well as solitude; and places where they can have these requisites must be provided for them, as well as separate places for fattening them, to which also solitude and darkness are congenial. Poultry of every description, while growing, are exceedingly active, and, in an artificial state, require a considerable extent of yard to enable them to take sufficient exercise for health. The variety of their food is also considerable, including not only animal and vegetable matter, but even, as a help to digestion, salt, sand, or small pebbles. As land poultry require a dry yard, so aquatic poultry require ponds; and, while the common hen will roost at the height of a few feet from the ground, the turkey and peacock prefer the highest trees. It must be evident from this variety in the nature of these animals, that every kind will require a separate house or compartment of a building, and that this house or compartment should be in four divisions; one for rearing, another for keeping full-grown fowls, another for incubation, and a fourth for feeding. For the first two of these houses or divisions, a yard for the purpose of allowing the fowls to take exercise and pick up food is essential, and in this yard there ought always to be an open shed for shelter from the sun or rain, abundance of sand, and small pebbles; and, for aquatic fowls, a large pond. The healthiest poultry of every description are those which are well fed in their yards in the morning, and allowed free exercise out of them the greater part of the day; and the fattest poultry are those which are confined in the dark, and not allowed to take any exercise. In all cases where poultry have not the free use of a large yard, they should have troughs filled with sand and small pebbles, placed so as to allow them to pick them when they choose, to promote digestion. We have described, in the *Encyclopædia of Agriculture*, the mode of fattening geese and other poultry, as practised at Strasburg; but it is too disgusting to wish for its adoption in any other country. These being the general circumstances connected with domestic poultry for architectural purposes, they may be classed in the three following divisions: viz., the web-footed or aquatic, which must necessarily, for every kind of treatment, be lodged on the ground floor; the common cock and hen, which prefer the floor above; and the turkey, guinea fowl, and peacock, which roost in lofty open sheds, or on trees. In small farms, therefore, all the different kinds of poultry may be lodged in the same house. Ducks and geese, with the other kinds, while rearing, on the ground floor; common fowls, when full grown, and while in a state of incubation, on the middle floor; and the turkey, &c., above. One yard may answer for the whole, provided it be sufficiently large, and contain a large pond. As warmth is highly conducive to the prosperity of poultry, common fowls are frequently lodged above cow-houses or stables, or even pigsties; and in other cases, when it is very desirable to cause hens to lay early in the season, their houses are heated by flues. When, however, the house is of a construction well calculated to retain heat, and it is perfectly dry below, and has few openings above, and a roof sufficiently thick to exclude all frost, artificial heat can very seldom be necessary. When it is desired to rear chickens for sale very early in the season, the eggs may be hatched by hot water, or in a bed of tan, dung, leaves, or other fermenting matter; and, after being hatched, they may be reared under a roof of glass, which roof may be employed in the summer season as a covering for vines. At Bagshot Park,

Surrey, there is a very extensive poultry establishment; and early in the season the fowls are reared in a vinery; and a writer in the *Gardener's Magazine* (vol. viii.) not only rears, but hatches, in a house of the same description. In the centre of the large yard at Bagshot there is a tree partially denuded of its branches, in order that it may serve as a roosting-place for the turkeys. In every poultry-house the places for incubation are small stalls or boxes, eighteen inches or two feet square, and open in front, in which the fowls sit on their eggs; and, after these are hatched, they are taken out into the yard, and the mother is confined in what is called a coop, an inverted cup of wickerwork, with the interstices large enough to allow the young brood free egress and ingress, while the parent cannot escape. These coops are frequently boarded on all sides, with a grated door opening in front. Partridges, pheasants, quails, bustards, and other gallinaceous birds are sometimes bred and reared in artificial structures, with a view to their domestication or increase in any particular locality. When this is the case, it is necessary to enclose them above and on all sides by netting, to prevent their flying away; because these birds are not susceptible of perfect domestication.

771. *The Pigeon-house, or Dovecote*, has been an appendage of the country-house from the earliest ages; and nothing can be more simple or universally known than its structure. The only essential requisite is, that it must be at some distance from the ground; because the pigeon is a bird that flies much higher than any of the domesticated fowls before mentioned. The openings for the birds may be in the roof, or in the highest part of the side walls, with shelves before the holes for the birds to alight on; and the walls of the interior may be lined with boxes, divided into square holes, for the birds to make their nests in; in short, into pigeon-holes.

772. *The Farmery Infirmary* is simply a house, or one or more divisions of one, in a quiet part of the farmery, large enough to contain a horse or cow in each division, and to serve as lodgings for animals under a course of medicine. Dryness and a command of temperature and ventilation are essential.

773. *The Store-houses for the Produce of the Farmery* include the barn; the straw-house; the granary; the root-house; the hay-barn; the maize-barn; the place for keeping pigs' food; the wool, hair, and feather room; the hop-loft; and the loft for miscellaneous products.

774. *The Barn* combines a manufactory and a storehouse, and is to the farm-yard, in the former capacity, what the kitchen is to a human dwelling; that is, it manufactures a great part of the food consumed in the other apartments or divisions of the premises. Formerly the corn barn was much larger than it has become necessary to have it since the introduction of threshing-machines. It should still, however, be of considerable size, so as to contain a rick of unthreshed corn of the size that such ricks are generally made on the farm. The size of the ricks, and the size of that part of the barn which is to contain the unthreshed corn, should be accommodated to each other; and the size of that part of the barn which is to contain the straw after it has been threshed, if the straw-room is not a separate building, should be accommodated to both. The form of the barn should, in almost every case, be a parallelogram, and at least twenty feet wide, with walls twelve feet high. The length will depend chiefly on the size of the ricks, and it is always most economical to have these small; not only because a small barn costs much less than a large one, but because both grain and straw are sweeter, and more relished by cattle, when recently threshed from the rick, than when they have been long kept in a barn, granary, or straw-room. Where the expense is not an object, it is desirable to have a room, as a granary, over that part of the barn which contains the machinery for threshing, and the room for cleaning up and measuring the corn. Into this granary the corn, as measured and put into sacks, may be hoisted up through a trapdoor by a windlass, with a rope and pulley. The position of the barn relatively to the other buildings of the farm-yard, depends on the position of the stables, and cattle-houses; it should always adjoin or be central to them, and be close to the rick-yard. Where the threshing-machine is to be driven by horses or steam, the barn may be set down on whatever side of the farmery is thought best for it; but where it is to be driven by water, local circumstances must often determine its position. In general, as the buildings of a farmery form a shelter to the cattle-yard, and as the barn is the highest of these buildings, it should be placed on that side from which the coldest winds blow; and this is also favourable for its proximity to the rick-yard, which ought to be in the most windy situation, for drying the corn when it is newly stacked. There is another reason for placing the barn on the most airy side of the farm-yard, which is, that when the threshing-machine is driven by horses, they are less apt to be heated in the track-shed, which should always be as open as possible on all sides. Wind machinery is also sometimes employed for driving a threshing-machine; and, when that is the case, the north side of the farmery is, in Britain at least, still the best situation. The most desirable power for driving a threshing-machine is water; and the next, in a coal country, steam.

775. *A Corn Barn on Posts* was erected by Morel-Vindé, at Celle, St. Cloud, in 1812; and the plan and details of it are given in his excellent work. He observes, that though the construction of a barn on posts is necessarily more expensive than one the floor of which is the ground, yet that it does not cost more than one third of a barn of the same size built of masonry, while it is a great deal better, especially in countries where timber is at a low price. When Morel-Vindé's work was published, the barn at Celle had stood twelve years without undergoing any alteration, or requiring the slightest degree of repair, and without a single mouse or rat ever having been seen in it. The great advantage of this barn is that of preserving the straw always as fresh as if it had just come from the flail: he has preserved it one and even two years, without its undergoing the slightest damage. The saving from the ravages of rats and mice, produced by such a barn, is found by experience to be more than fifteen per cent; and, compared with barns built of masonry, there is also another saving, that of being able to fill it with corn the first year; whereas a barn with stone or brick walls requires a year to dry them. The wood of which this barn is composed was not felled on the 25th of March, 1812, and yet the barn was completed by the 25th of June in the same year; and in the harvest following 15,000 sheaves of wheat were put into it. The only kind of wood employed in this barn is that of the Lombardy poplar, with the exception of the posts, two feet high, which are of oak; it is covered with slates; and the whole cost was only £182 : 5*s.* : 10*d.* in the neighbourhood of Paris. In the departments of France, the cost is estimated at £109 : 7*s.* : 6*d.* Fig. 808 is the ground plan, on one half of which are shown three sleepers

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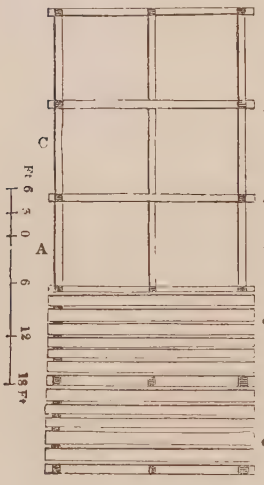

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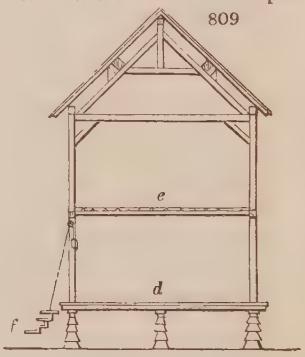

the whole length of the structure, *a a a*, which support the joists, *b b*, on which is laid the planking, *c*. Fig. 809 is a cross section of fig 808 on the line A B, on which are shown the threshing-floor, *d*; a floor over it, *e*, and the suspended fold-up steps, *f*. Fig. 811 is a cross section of fig. 808, on the line C D, showing that there is no second floor over any part of the barn, but the threshing-floor, as seen in the preceding figure. Fig. 810 is an elevation of one end, showing the cross braces, which are only placed in the ends and sides. Fig. 812 is a side view in which may be seen the threshing-floor, *g*; the end of the floor over it at *h*; and, in the roof, four small openings for the escape of the wind during stormy weather, to prevent its blowing off the roof

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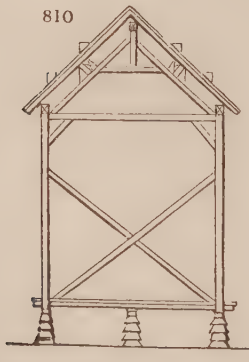

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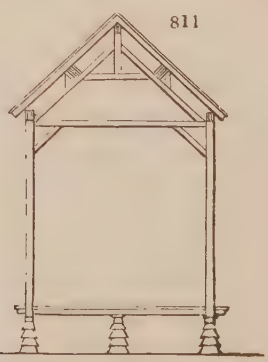
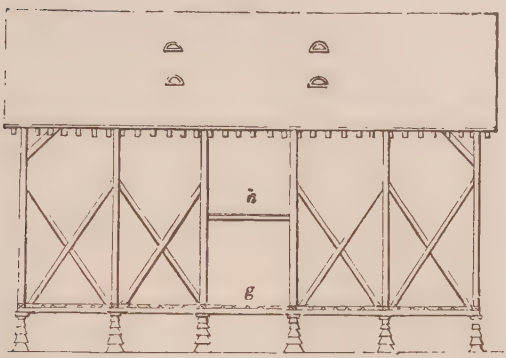


The side view of these openings is seen in fig. 811. Fig. 813 is a longitudinal section, showing the cross braces which strengthen the upright posts, and the construction of the roof.

812



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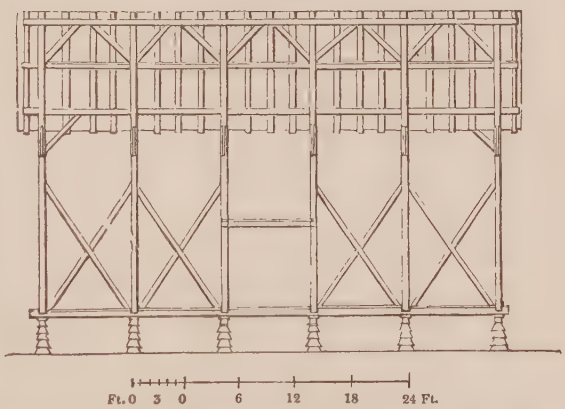

776. *In the Construction of the Corn Barn at Celle*, the object was to enclose a space fifty-five feet long, twenty-two feet broad, and twenty-two feet high, without taking into calculation the space contained in the angle of the roof, which was eleven feet high in the centre, the angle of the side being at forty-five degrees, for the better throwing off of the rain. Numbers divisible by 11 were made choice of, because experience has shown that eleven feet is the maximum of length which can be given to beams placed horizontally, without risking their bending. The fifty-five feet of length are therefore divided into five bays, which are contained between six frames of carpentry, placed eleven feet apart, and of which two form the gables at each extremity. Eighteen foundations of masonry are built in the angles of ten squares (see fig. 808), each eleven feet on the side, and carried up fifteen inches above the surface, in order to support eighteen stone plinths, on which are placed eighteen oak posts, two feet high and one foot square, fixed to the stone by oak pins one inch square and two inches long, which are let half way into the post and half way into the stone, with tenons at their upper extremities for being mortised into the sleepers. By these means the eighteen pillars are raised to the height of three feet from the surface of the ground; the two lower feet are covered with slates, as shown in fig. 814 from *i* to *k*, and the foot immediately under the joists is covered with twelve panes of window glass, each a foot square, retained in their places by two small fillets of wood at *k* and *l*, to which they are cemented at the upper and lower edges only, and without any finishing at the angles. The glass is to prevent the ascent of rats.

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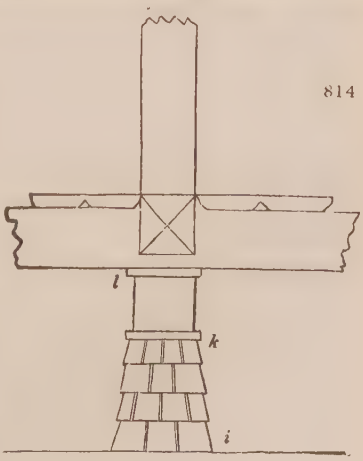
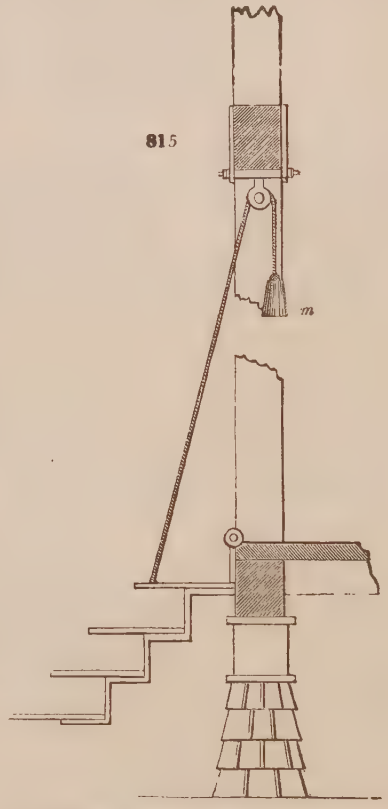


On the eighteen pillars, presenting on their upper extremities eighteen tenons, is placed, first a frame of carpentry composed of three sleepers the whole length of the structure, which may be easily cut out of trees of Italian poplar; and, secondly, six sleepers of twenty-four feet long each, crossing the three long sleepers, and let into them by notching out each to the depth of one third. The three long sleepers contain, on their under sides, mortises to receive the tenons of the oak pillars, and these are made fast by wooden pins. On this frame is placed the skeleton of the building, which is rendered plain by the sections and elevations represented in fig. 809 to 813. The skeleton of the superstructure consists of twelve upright posts, each twenty-two feet high, framed into two top plates extending the whole length of the barn, and into six cross plates. This framework completes the skeleton of the rectangular part of the building. The roof is composed of twelve principal rafters, on which are placed two purlins; and on these rest the secondary rafters, to which are nailed the laths for receiving the slates. The eaves of the roof project about four feet on each side, to protect the unthreshed corn or straw from the rain; it also projects about two feet at each end, for the same purpose. This is the more necessary as the sides are not covered with boards. All the joinings of the timbers in this building are by tenon and mortise, and all the pins used are of wood, with the exception of those employed for nailing on the laths for receiving the slates, and the nails used in fastening them. With these exceptions, there is not a single piece of iron in the whole of this structure; and there is no other metal used, except four pieces of lead for the four openings in the roof. In order to make certain of excluding the rats and mice, by rendering it impossible that the thresher should ever forget to turn up the folding stair when he leaves his work, two chains or ropes are attached to it, one on each side, counterbalanced by heavy weights, as shown at *m*, in fig. 815. In case of the roof requiring repairs, twenty-four hooks of iron may be placed at equal distances along the ridge, to which the slater's ladder may be hooked on. Instead of painting or tarring the timber work, it may be covered, on the exterior sides, with slates. We examined this barn and the other buildings at Celle, with M. Bailly de Merlieux, in 1828, and were highly gratified with it. We consider it a model for economy and usefulness, and would strongly recommend it to the American farmer.



777. *The Straw-house* is generally the end of the barn opposite to that in which the unthreshed corn is placed; but in large farms it forms a separate building, adjoining and connected with the barn, and opening into the different cattle-houses and cattle-yards.

778. *The Granary*, where the barn is not sufficiently high to admit of its being placed in the roof, is commonly placed over the cart-shed, or some other building. It is sometimes built apart; but this is a needless expense, and seldom incurred in wooden constructions. A detached granary should be built on pillars with projecting caps, to prevent the ascent of rats and mice; and it should have windows filled in with luffer-boarding on all sides, for thorough ventilation; it should generally be placed exterior to the cattle-yards, in any open situation not far from the barn. When the granary is placed over any other building, it is always convenient to have a windlass fixed in it; either immediately over a trap-door in the floor, or over a door in the outside wall; through the first of which, sacks of grain may be hoisted up from the corn-room of the barn, should the granary be placed over it; in the other case, be raised up from, or let down into, a cart.

779. *A Granary with a Loft for Wool above, and a Cart or Implement Shed beneath it*, is given by Morel-Vindé, which, where economy of room and money is an object, we consider a most excellent model. The material of construction is entirely timber of small dimensions, no piece in the whole structure exceeding ten feet in length; and only the story posts, or supporting pillars, are so much as nine inches square. Fig. 816 is the ground plan of the cart-shed or ground floor, fifty feet by thirty feet.

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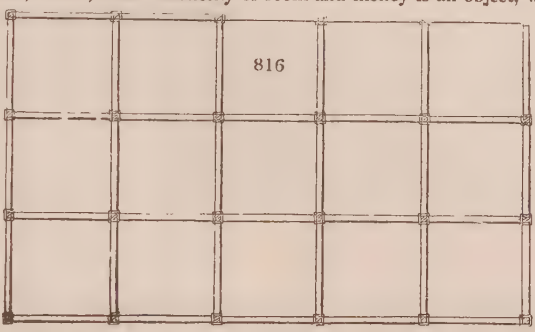

The height to the under side of the floor above is ten feet. The two longitudinal sides of this plan are carried up perpendicularly as gables, and the two ends are hipped in at an angle of forty-five degrees, as shown in figs. 818 and 819. The granary floor is of the same dimensions as the ground floor, and the wool floor, fig. 817, which is above the granary, is thirty

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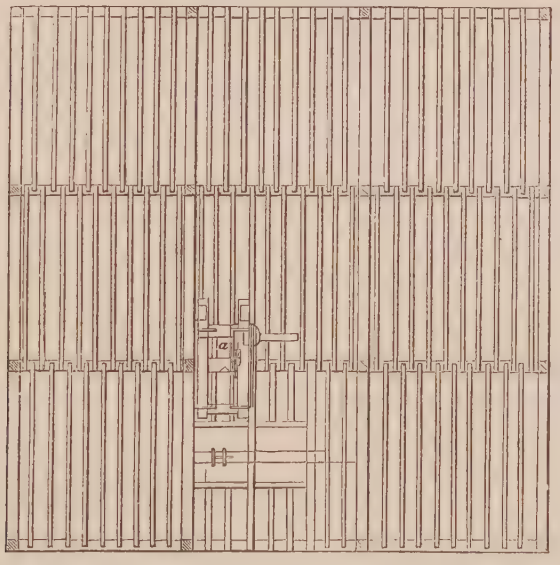
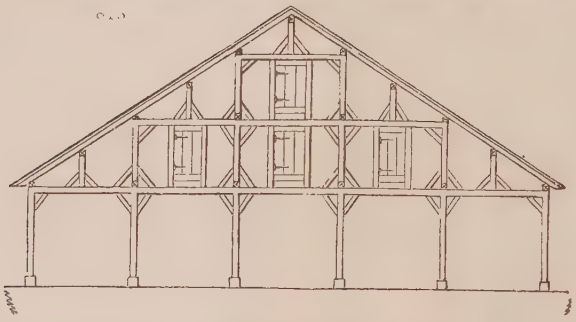


feet by thirty feet. The granary and the wool-room are both seven feet high. The grain and wool are both taken up and let down through a trapdoor, by means of a windlass fixed over it, as shown at *a*, in the plan of the wool room. Fig. 818 shows the longitudinal elevation of the building, in which may be observed three doors to the corn granary, and one door to the loft over it. Fig. 819 is a longitudinal section through the centre of the building, showing the situation of the windlass, *b*; and the pulley over which the rope passes, *a*. Fig. 820 is an end elevation, and fig. 821 a cross section. The total expense of this structure, in the neighbourhood of Paris, in 1819, was £247, and the estimate for the departments of France was £150. Such a building is admirably calculated for a country where small timber is the cheapest building material; and we have introduced it with a particular view to America and Australia, as it might be put up by the very commonest description of country carpenter. The granary might even be used as a hay-loft, or a loft for maize or Indian corn in the ear, and the wool-room may be employed as a granary or seed-room, according to local circumstances. By means of



the trapdoors and windlass, any article might be hoisted up from or let down into carts with very little labour or loss of time. Should it be intended, before creating this

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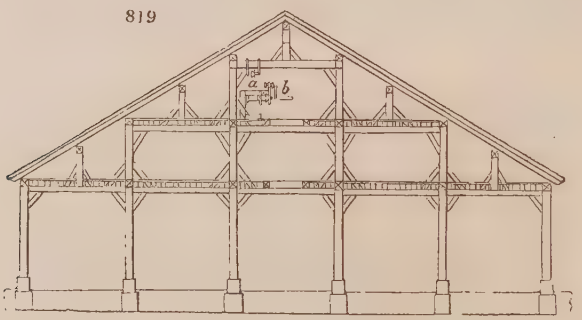

building, to use the granary as a hay-loft, or hay-barn, the floor need not be laid with boards.

780. *Storehouses for Roots*, such as potatoes, turnips, mangold-wurtzel; and temporary depositaries for clover, tares, or other green food, or for chaff, hay, or other dried food, should be placed next to the houses or yards of the animals which are intended to be fed by them. In form they should either be squares or parallelograms, as giving most space at least expense. They should have ample doors, generally of such a width as to admit of setting back a loaded cart into them, and shooting down the article to be stored up. Food which is to be consumed immediately in feeding cattle, such as green clover, tares, turnips, &c., may also be laid down at once in proper recesses or stores formed in the houses or sheds in which the cattle stand. Food which is to be steamed, or otherwise prepared, before it is given to cattle, should be stored next to the place of preparation.

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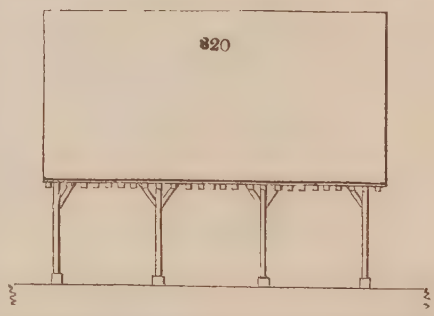

781. *A Barn for Hay* is used on some farms, though the practice is given up by the best farmers as too expensive, and as being less favourable for keeping the hay than stacks or ricks in the open air.

782. *A Barn for keeping the Ears of Maize* is sometimes required in countries where that corn is grown upon a large scale. Barns of this description should be made quite narrow, and open on the sides, so as to admit a thorough current of air; and, to prevent the weight of the ears above from compressing those below, there should be horizontal

floors of open work on which the corn may be borne in separate layers. A small maize-barn on this construction, and supported on posts six feet from the ground, has been erected by M. Mathieu de Dombâsle, at Roville, near Nancy.

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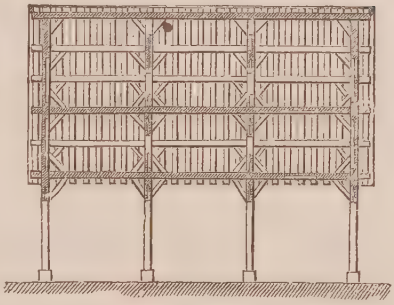

783. *A Store Place for Pigs' Food* is a most useful part of a large farmery, which never can be properly conducted without keeping pigs. It ought to be a dry well-aired room, near the piggeries, and should be of considerable size, so as to have two tubs or tanks for liquid food, the one being always filling while the other was emptying, after the contents had undergone proper fermentation; and three or four divisions, for different kinds of meal and other dry food. The situation should be close to the pigsty, so as to minimise the trouble of supplying their troughs.

784. *Storehouses for Hair, Wool, and Feathers* should generally be formed in dry airy lofts; and, as nothing is more offensive or unwholesome than the decomposition of these materials, no one, as before observed (§ 711), ought to be allowed to sleep, or to work for any length of time, in such places.

785. *The Storehouses for the Machinery and Implements of the Farmery* include the cart and roller shed, the plough and harrow house, the house for hand implements, the harness-room, the chaise-house, and the place for miscellaneous articles. Of several of these it is unnecessary to say any thing.

786. *Storehouses for portable Machinery and Implements* should be placed apart from the houses for live stock; and they should not, if it can be avoided, open into a yard in which cattle or swine are at large. The sheds for carts and waggons are generally left open in front; and, when this is the case, they should face the east, in preference to the west, from which driving rains are to be expected; and the north, rather than the south, because the intense heat of the sun is apt to warp the wood, and occasion a shrinking in the joints. Houses for smaller tools should have closed doors, and luffer-boarded windows for better ventilation, and their floors should always be perfectly dry and free from litter. In general small implements should be hung up, or supported at some distance from the floor, that they may be kept drier and more airy; and those of iron should be placed horizontally rather than vertically; because it is found that in the latter position they become in time magnetised, and more apt to rust and decay at their extremities.

787. *A Harness-room*, for harness not in use, should also be a dry airy loft, or otherwise a room on the ground floor, with a fireplace to admit of occasionally drying and ventilating it by artificial heat.

788. *The Working-houses of the Farmery*, besides the barn already mentioned, include the slaughter-house; the carpenter's shop; the smith's shop and shoeing-house; and a room for pickling wheat, cutting potatoes, carrying on various miscellaneous works, &c.

789. *A Slaughter-house* is necessary in a farmery of considerable extent, as it will always be found profitable for a farmer to kill as much of the meat used on his farm as possible. This part of the farmery should face the north: it should be well ventilated, but without admitting light, because darkness tends to exclude the flies. The floor should be paved, and have a sink and trap communicating with a manure tank.

790. *A Room for a Smithy, and another for a Carpenter's Shop*, are required in very extensive farmeries; and they should generally be placed so as to open into a small yard devoted to the different materials used by the carpenter and smith, and to machines and implements undergoing repair, &c.

791. *A Room of All-work* is necessary in every farmery, whether small or large, and it may generally adjoin the slaughter-house. In it there should be a boiler for preparing drinks for sick cattle, or for supplying hot water for other purposes. Wheat may be pickled or brined, and other seeds prepared, in this room; harness cleaned, tools sharpened on a grindstone, chaff or roots cut by machinery, malt ground, &c.

792. *Bee-houses* are seldom requisite, where bees are kept, unless for the purpose of preventing the hives from being stolen; and this Huish and other writers propose to do by chaining them to the bee-stand. A bee-house is very conveniently formed in the end or side of any building, or in a wall, facing the south-east, east, or south. There should be a recess, or a projection formed so as to give the effect of one; and in this recess there should be shelves of stone or boards, eighteen inches broad, and from eighteen inches to

two feet one above another. In front there may be either a grated iron door, or several horizontal iron bars, to lock, so as to permit the free ingress and egress of the bees to and from their hives, and yet prevent any person from taking them out.

793. *Dogkennel.* A watchdog is common to most farmeries, and the shepherd's dog is a valuable assistant where flocks of sheep are kept. The proper position for the watchdog is the middle of the open area between the farm house and the farm-yard, in order that the dog may have a complete view of the yard, and be seen both from the yard and house, as well as by all strangers who approach either. The lodging-place for the dog is commonly a roofed wooden box with an opening only on one side, the consequence of which is, that he may be passed by persons on the other side without his seeing them. We would suggest the idea of raising the dogkennel eighteen inches or two feet, by placing it on a knoll sloping on every side, and of having two or three panes of glass on each side, that he may see every way around him. To enable the dog to lie in his kennel with comfort during hot weather, we would form two openings the whole length of the sides of the kennel, close under the eaves of the roof, by means of hinged flaps, which could be let down during summer, and put up and fastened with wooden buttons in severe weather. Kennels for dogs kept for field sports belong to the subject of villas.

794. *A Lodge for single Men* sometimes forms a part of farmeries, and should always consist of one large well lighted and comfortable room for cooking and eating; and another, also large, dry, and well ventilated, for sleeping in. These rooms ought to be placed near to the stables and cattle-sheds; and perhaps it might not be amiss, in some cases, to have speaking pipes from the stables and cattle-houses to the men's bed-room, in order that they might the more readily hear any noise made there in the night-time. Near London, where farms are liable to be robbed, we have known the farmer have a speaking or hearing pipe, communicating from his bed-room to his dogkennel, and also a wire connected with his dog's collar, by means of which he could loose the animal, without moving from his bed. Mr. Ackermann, the celebrated printseller, has a contrivance somewhat similar, in his villa near Fulham.

795. *Cottages and Gardens for married Servants* are built in the neigbourhood of the farmery, in all the large farms in the north of England and in the south of Scotland. Sometimes they form part of the farmery, but in general they are 200 or 300 yards apart from it. The convenience of proximity is, however, so great, that we think the distance should be diminished rather than increased. These cottages, in Scotland more particularly, are very wretched habitations, even on the most extensive and best cultivated farms. In 1831, we examined some farm labourers' houses of this description on a very large and admirably cultivated farm, on the Duke of Buccleugh's estate in Dumfriesshire. The dwelling-house on this farm (Cumroo) is more than usually large, with two rooms in its width; a part of its exterior wall is covered with well trained and wide-spreading fruit trees; and there is an excellent kitchen-garden, well stocked, and apparently in good order, in which, when we saw it, a professed gardener (judging from his blue apron) was at work; so that the whole, had it not been for the farm-yard behind, might very easily have been taken for a mansion residence. Passing this house, and advancing about half a furlong, we came to a row of fourteen cottages, occupied by yearly servants of the farmer who resided at the large house, and who, we were told, came from the best-cultivated district in Scotland, East Lothian. Observing that to every door in this row of cottages there was but one window, we entered one of them, and found a woman sitting at a table, writing a letter (which seemed in a very good hand for a person in her rank in life), while she rocked the cradle with her foot. The room, which comprised the whole cottage, was about fourteen feet square, without a ceiling, and open to the roof; the floor was of earth, and the walls were left rough, just as the stones were put together in building, but whitewashed: there was a fireplace, but only one fixed window of four small panes. In this room there were two box-beds, placed end to end, and, behind, a space of about two feet in width for fuel and lumber. The furniture and utensils, though scanty, were clean and neat; more especially when contrasted with the floor, which, underneath the box-beds, which have no valances, was of earth, quite loose, though near the fire were laid some flat stones, which the woman said her husband had picked up and put down himself. The cottage window, as already observed, was fixed, and incapable of opening to give air. There was no back door, and no opening either in the roof or walls for ventilation, except the entrance door and the chimney. There was no appendage, nor garden ground of any sort, behind these cottages; but across the road, in front of them was a narrow strip of ground, divided so as to allow one fall (thirty-six yards square) to each cottage. In these gardens was no structure of any kind. (*Gard. Mag.* vol. viii. p. 265.) There are few of the houses of married farm-servants in Scotland any better than those at Cumroo, where they are built by the tenants; but we hope that the time may not be far distant, when the landlords will

undertake this part of the farmery, as well as those buildings which are destined to lodge cattle, or protect produce or implements; which are now deemed of so much more importance than the cottages, that their erection is not intrusted to the farmer.

796. *By the Extra-Buildings of a Farmery* are to be understood those which do not belong strictly to agriculture; but which, nevertheless, are to be found on particular farms, and the businesses for which they are calculated carried on by the farmer, as well as the common culture of the farm. This practice is, no doubt, at variance with the principle of the division of labour; but as it does exist in many cases, and must necessarily long continue to do so in new countries, we cannot avoid shortly noticing such extra-buildings, in a work addressed to occupiers of land, and dwellers in the country generally. They may be included under corn mills, malt-houses, hop oasts or kilns, cider-houses, kilns for drying corn or other seeds, and for general purposes, limekilns, houses for manufacturing meal from potatoes, distilleries, beet root sugar manufactories, &c. We shall shortly describe the most common of these, and such as are most closely connected with general agriculture. The reader whose situation may render him particularly interested in any of those not noticed in this work will find every information he could wish, accompanied by plans, sections, and details, in the *Dictionnaire Technologique*, and in the *Agriculteur Manufacturier*; the latter one of the most scientific agricultural periodicals published in France.

797. *Corn Mills* are of various kinds; the principal of which are those for grinding or husking oats, barley mills, and flour mills. The first class is sometimes connected with the threshing-machine; more especially in Scotland, where it is driven by water, or impelled by steam. The farm in this case is always small, seldom exceeding 100 acres; and, as the occupier's attention is divided between his mill and his land, he rarely succeeds either as a miller or a farmer. Still we see no reason why an active intelligent man, with sufficient capital, might not excel in both, and thus secure to himself the profits of the grower, as well as those of the manufacturer, of corn. The same observation may be made with respect to barley and flour mills; and, no doubt, will apply to a variety of others which are used for manufacturing farm produce.

798. *Malt-houses.* The manufacture of malt being a much more simple process than that of grinding meal or dressing flour, a malt-house is a very common appendage to the farm-yard in the barley districts of England. A malt-house and kiln comprehend three divisions; a floor, or place for steeping the barley, and managing it, till it has germinated; a kiln for drying it, to check vegetation; and an airy loft for cooling it, and rendering it so dry as to admit of its being put up in sacks, without the risk of its undergoing fermentation in them. The floor for germinating the corn may be level with the surface of the ground; or, if the soil be dry, it may be three or more feet below it, as, the warmer and moister the atmosphere is, the better it will be for the vegetative process to be carried on. One end of this room should contain a cistern for steeping the barley; and near it should be a pump for supplying water. The barley, when the process is completed, is thrown out on the floor, and turned over till it has sufficiently germinated. It is now ready to be put on the kiln; and, after being properly dried there, it is spread out on the floor of the loft, which is generally over the malting-room, and of the same size; being thoroughly ventilated by having luffer-boarding on both sides. The building containing the kiln may be advantageously placed at that end of the malting-room which is opposite to the end containing the cistern; and the floor of the kiln, and that of the upper or drying room, ought to be on the same level, for the convenience of throwing out the malt to be cooled and dried. The common form of all kilns is that of an egg, with the broad end uppermost; or of two inverted cones, placed base to base, the floor for drying on being formed where the diameter of the shape so produced is broadest. The fire is made at the bottom of the kiln, and the smoke from the fuel, and the vapour from the articles drying, are allowed to rise directly through the floor above it, and to pass off by a chimney covered with a cap or cowl, mounted on an upright shaft, and furnished with a pivot, so as to turn freely with the wind, and present the opening for the emission of smoke and vapour always on the sheltered side. This form of kiln and mode of management are still continued in Aberdeenshire, and in other parts of the north of Scotland; and the malt made there takes a particular flavour according to the kind of fuel used. The malt most in repute is what has been dried with birch wood. In England the fuel used is most generally wood, coke, or Welsh coal; none of which produces a smoke injurious to the flavour of the malt, so that the heated air which arises from the fire is allowed to pass directly through it. The principal modern improvement in the construction of malt-kilns consists in the employment of a furnace and flues, in the lower part of the kiln, by which common coal, or any description of fuel, may be burned there; and heated air, being generated on the sides of the furnace and around the flues, ascends through the malt, instead of the combination of air and smoke which issues from an open fire. The sides of malt-kilns are of masonry, and the drying-floor is commonly formed of cast-

iron plates, sixteen inches square, and three eighths of an inch or half an inch thick, pierced with holes an inch apart, half an inch in diameter on the under side, and contracted to the eighth of an inch on the upper side. Sometimes tiles pierced in the same manner are used instead of iron plates; and a kiln tile, about a foot square, ought to contain 900 or 960 small holes. Whether tiles or plates are used, in either case they rest loose on wrought-iron rafters, with a narrow rib along the middle of the upper edge, which forms two rabbets for receiving the plates or tiles. Wirecloth, supported by iron rafters, is used occasionally, but it is found not to be sufficiently durable; or perforated sheet iron may be employed. This last material was formerly almost exclusively used for drying pale malt, but it is now found that with cast-iron plates or tiles, like those above described, the malt may be made pale or brown at pleasure. The space between the floor tiles and the top of the furnace or flues is commonly between five and six feet: this space is called, in Norfolk, the *dunge*, and into it fall the chives or cooms which, in the process of turning and drying, are rubbed off the malt; and these form an excellent manure, under the name of malt dust, as well as a good mash for sick cattle. The proportions of the openings on the top of the kiln, and for admitting air to be heated over the furnace, relatively to the area of the surface of the kiln, are points rather difficult to adjust. For a kiln twenty-seven feet square, a circular opening at top, of about five feet in diameter, will generally be found sufficient; and the area of the openings on each side of the furnace and flues, for the admission of cold air to be heated, must, when united, equal that of the opening at top. These openings for the admission of the external air should have regulators of sheet iron balanced by weights, so as to adjust the draught according to the heat, and the state of the malt. A great improvement has been lately effected in some of the Norfolk malt-kilns, by the dismissal of that unsightly and expensive appendage, the cowl, before-mentioned, as being placed over the orifice at top. This cowl, until of late years, was deemed an indispensable part of every malt-kiln; but to Mr. Salmon of Stoke-ferry is due the merit of the discovery that it may be wholly dispensed with. In lieu of them this gentleman substitutes a flat circular canopy of sheet iron, supported on iron rods. By this improvement, not only the exterior deformity is got rid of, but also two large interior beams; the one forming a guide, and the other a base and pivot for the upright axle of the cowl. In a country like Britain, where malt is heavily taxed, there are necessarily a variety of observances having reference to the duties of the excise officers, which occasion some peculiarities in the details of construction; such, for example, as the malt couch, dry cistern into which the malt is thrown from the steeping cistern, before it is spread on the floor, in order to be gauged; but these we leave unnoticed at present, as unconnected with general principles.

799. *Hop-Oasts, or Hop-Kilns*, are constructed much in the same manner as the malt-kilns; and the principal modern improvement which has been made in them, that of substituting hot air cockles for open fireplaces, is common to both. In the old plan of the hop-oast, the fire was made on a grating at the bottom of the kiln, with what is called a spark plate (a broad plate of cast iron, to reflect back the sparks, and prevent their reaching up to the hops) placed at the distance of a few feet over it. Instead of being laid on a perforated floor of iron or tiles, hops are almost always dried on haircloths. These are supported on a floor formed of wooden spars or laths, about two inches and a half square, and nailed, two inches apart, to wooden joists. The haircloth is laid upon this floor, and its edges round the sides of the kiln are hung up by loops, to prevent the hops from falling over into the fire-chamber below. The form and size of hop-kilns vary, but they are generally built square, as being most suitable for covering the drying-floor with a cloth; and the ordinary size of a drying-floor for a hop ground of two statute acres and a half, is eleven feet on the side. This size will dry three changes of hops in twenty-four hours. The floor of the kiln ought to open into a loft on the same level, into which the hops are thrown to cool. In one part of this loft is a circular hole, about two feet in diameter, with an iron rim round it, on which is placed the hoop to which the mouth of the bag or pocket in which the hops are to be packed is sewed. This bag hangs down through the floor into the place below, which may be a cow-shed, or, as it is very frequently in Worcestershire, a cider-house; and a man gets into it and treads down the hops as they are thrown in to him. The fuel which is used for drying hops, when the smoke is allowed to pass through them, is coke; and that made from very sulphureous coal is preferred, as tending best to preserve the colour of the hops. In the management of hops in Britain, there are a variety of arrangements connected with the kiln and hop-loft, rendered necessary by the mode of collecting the excise duty; but these we take no notice of here, as our object is merely to lay down the general principles of drying, from which every Architect can deduce the most advantageous forms.

800. *A Drying-Kiln for General Purposes* is a useful building for a corn farm in a wet climate, and it may be easily constructed, at very little expense, and scarcely any loss of room; since the drying-floor may be used as a granary or store-room, when not

required for drying on. In the north of Russia it is frequently found necessary to dry the corn, while in sheaf, in a particular description of kiln, the characteristic of which is, that the floor is of wooden rafters about a foot apart, and at least twenty feet above the hearth on which the fuel is burnt. There are various uses to which a farmer could apply such a kiln as might be used for drying either malt or hops; and since it is very desirable for every farmer who grows barley, to make his own malt, and brew his own ale, we think a drying-kiln ought to be considered as a part of the farmery on every large farm.

801. *A Cider-house* is only essential to an orchard farm. Where the fruit, as in Devonshire, is ground between rollers, the house for containing these need not be large; but where it is ground in a circular trough by a stone roller mill, as in Worcestershire, greater extent of space is requisite. It seems to be agreed on by the most competent judges, that the Worcestershire practice is by far the best; for, while the fruit is merely torn and crushed to pieces by being passed between two revolving cylinders, it, together with the rind and seeds, is reduced to a pulpy mass by the continued revolution of the stone wheel in the trough. The exposure of the pulp to the atmosphere, while this process is going forward, is also more favourable to its absorption of oxygen, than that given to it by the cylinder mill, from which it drops at once into a vat. Hence the great superiority, in flavour, of the Herefordshire and Worcestershire cider over that of Devonshire. It may be observed, also, that the malic acid corrodes the metal of the iron cylinders, and thereby injures the liquor; and further, that the machinery which impels these cylinders is much more liable to get out of order, than the extremely simple apparatus by which the roller mills are driven. In choosing a stone for a roller to grind fruit, all such as contain lime must be avoided, on account of the action which the acid of the fruit would necessarily have on it. Granite, quartzose rock, or millstone grit, is therefore necessary. The stones are mounted so as to turn in a circle of from ten to twelve feet in diameter, in the manner which we shall describe when we give an example in our succeeding section.

802. *A Limekiln* is a most valuable article on a farm containing limestone, or with limestone in its neighbourhood. We are even of opinion that, where fuel is abundant, a kiln for burning a portion of the soil of the farm, whether calcareous or clayey, would be a valuable source of manure; because all calcined earths, in consequence of their affinity for oxygen and carbonic acid gas, decompose air, water, and insoluble organic matter. Almost all clayey soils contain a certain proportion of lime; and it has been found that when such clays are calcined, and spread on any soil, even the same as that from which they were taken, they add to its friability and fertility. There are various rude modes of burning lime adopted in different parts of the country: in some districts it is mixed with the fuel, and burned in heaps; in others it is burned in kilns in the form of an inverted cone, or of an egg with the broad end uppermost; but the most improved form has been determined, by Mr. Menteath of Closeburn, after long experience, to be that of an inverted wedge rounded at the angles. The advantage of the wedge or oval form in the ground plan of a kiln is, that it admits of two or more openings at the bottom for emptying the kiln, by which that work can be more speedily performed than in the common round kilns, which admit of only one opening; and by which improvement, of course, more lime can be burned in a shorter time. The great object, in burning lime, is to burn it thoroughly, with the least possible expense of fuel, and in the shortest time; and for these purposes the kilns of the most improved construction, in addition to the wedge shape for the expeditious emptying of the kilns, have either non-conducting movable covers, or very small openings at top, into which the fuel and limestones are thrown. The first inventor of the cover for limekilns was Booker of Dublin; but they have since been greatly improved by Mr. Menteath, as we shall show hereafter, in giving designs. A most scientific combination of a limekiln with a coke oven has been made by Mr. Heathorn of Maidstone; in which the lime is burned by the gases which are driven off from the coal while it is being turned into coke, and which gases would otherwise be entirely lost. Of this kiln, also, we shall hereafter give a plan.

803. *Buildings for carrying on Agricultural Manufactures*, such as making potato flour, extracting sugar from the beet, maple, or cane; distilling spirits; crushing seeds for oil; preparing woad, or weld, or flax, or hemp, and similar operations, have nothing so peculiar in them as to demand the particular study of the Architect; the building being, in all these and similar cases, rendered subservient to the machinery.

804. *Water* is essential to every farmery, both for supplying the cattle with it to drink, for washing the feet of horses, &c., and for other purposes of cleanliness. The most convenient form of supplying this is from a well with a pump, in a central part of the yard. If the subsoil do not naturally afford water, the well, or in that case the tank, must be supplied artificially, either by pipes laid from some distant spring, pond, or brook; or from the rain which falls on the roofs of the buildings. We have already, § 151, given Mr. Waistell's design for a tank, and shall here submit a plan which has been sent us by our ingenious and most scientific contributor Mr. Mallet.

805. *Mallet's Tank*, fig. 822, is calculated to save expense; first, by using a figure of maximum capacity and minimum surface; and, next, by being able to dispense entirely with the centring, which, according to the present practice, is used for arching over tanks. Mr. Mallet proposes for very large tanks to adopt a spherical form; but for any of less than five or six feet in diameter, a short cylinder with hemispherical ends, as shown in fig. 822. The excavation being made, the building is commenced, either with a single brick at the bottom, *a*; or better with a circular piece of stone laid on a layer of tenacious clay, tempered as dry as possible, well beaten together, and previously mixed with some salt to prevent the worms from working through it. This layer of clay, *b*, completely surrounds the brickwork in every part, to make it retain the water. The bottom part is now built all with common mortar, in the form of an inverted dome, nine inches thick; then the perpendicular part, *c*; and, lastly, the upper dome. Now, any common arch may be built without centring as far up as where the courses lie at an angle of about thirty-two degrees, or what is called the angle of repose for masonry; that is, where the bricks will first begin to slip off; but a brick dome may be built of any size, entirely without centring, for the following reason.—Referring to fig. 823, *d d* are two bricks supposed to belong to part of the course of bricks next above that at the angle of repose. Each of these is to be considered, with the mortar in which it is embedded, as a quadrangular prismatic frustum, whose sides all incline towards the centre of the hemisphere at *e*: now, the upper surfaces of these two bricks form an internal or reentering angle with one another, from the position they lie in on the preceding courses; that is, they lean against each other, as if they lay on opposite inclined planes, as shown in fig. 824. If, then, these

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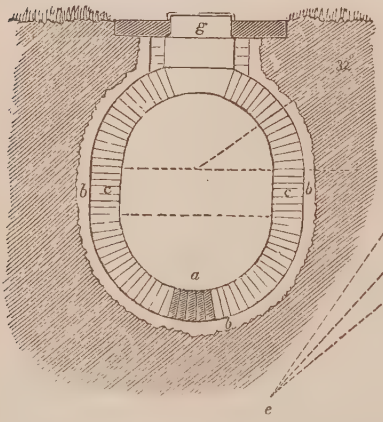

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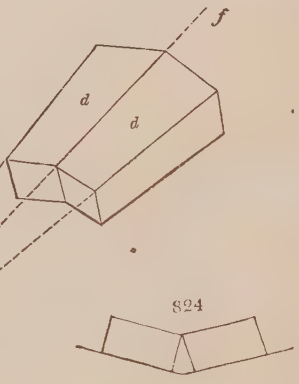

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bricks slip, they must do so in the line *e f*; but, in doing so, they must approach each other: but they are already in contact, therefore they cannot slip. This demonstration applies to any greater number of bricks, until the whole course is finished, when the bricks are sustained by their lateral thrust. There is a limit to the weight of the voussoir (the overhanging part of an arch, looking up from under it) which will support itself in this way, as must be obvious to every one from the common principles of gravitation. It is also obvious that a dome may thus be either left open, or closed at top. To make the tank perfectly watertight, it is finally coated over two or three times with coal tar inside. A manhole is shown at *g*, in fig. 822, for getting in to clean it out occasionally. This plan of building without centring is applicable to constructing large architectural domes, provided they be of brick, and that they be afterwards plastered outside with Roman cement, which would stand as well on a dome as on a wall; and, the great expense of heavy domical centring being got rid of, domes on our large public buildings might be more common than they are at present. The hollow bricks invented by Mr. Frost might be here advantageously used. The usefulness of this plan of building without centres, in constructing ice-houses, fruit-cellars, ovens, kilns, sewers, &c., is obvious. Mr. Mallet adds, "I have built one tank on this plan, which holds sixty hogsheads: it was built by one mason in four days, and never leaked a drop, although one side of it stood close to an area wall, where the least moisture would have been visible."

806. *Ponds* formerly were thought essential to farm yards, partly for supplying water for the cattle to drink; but chiefly for the horses to wade through, in order to wash their

feet. The first use is now, in all the best-planned farmeries, supplied by troughs or cisterns from pumps; while the horses' feet are either washed in the stable with water in pails; or the horses are made to walk repeatedly through a narrow trough with a paved bottom, and with oak or stone sides. This trough, which ought to be placed near a pump, and opposite the stables, in the side of the passage between the buildings and the dung-yard, may be three feet wide, six inches deep at the two ends, and gradually increasing in depth to the middle, where there may be three feet of water. It must be acknowledged, however, that in many, perhaps in most cases, the best mode is to wash the legs of horses while in the stable; because, when they are ridden into a pond or trough, while warm from the plough or the cart, they are very apt to catch a cold or rheumatism from the sudden chill produced by the cold water. This will chiefly depend on the distance which the horses have walked after they have left off work. Horses taken out of the gin wheel of a threshing-machine should never either be driven through a pond or through a trough, for similar reasons, as will be obvious to every farmer. In all cases, when the feet and legs of horses are washed, they should be immediately rubbed dry with straw and cloths.

807. *The Yards of Farmeries* are, the corn-yard, the hay or dried herbage yard, the cattle-yard, the sheep-yard, the poultry-yard, the dung-yard, the implement-yard, and, in large farmeries, the yard for the carpenter and smith.

808. *The Corn-Yard* is that which contains the stacks of corn, and should always be placed adjoining the barn, and on the most elevated and airy side of the farmery. The size ought to be regulated by the size of the arable part of the farm, and of the barn; because no rick ought to be made larger than what could be contained at one time by the corn bay, or end for unthreshed corn, of the barn; and, consequently, a small barn will require a larger rick-yard than a large one. The form, in this case, as in almost every other yard or building on a farm, ought to be rectangular, and as near as may be convenient to that of a square. Acute-angled or round forms are necessarily attended with loss of space, and great inconvenience both in building the ricks, and in removing them to the barn. The ricks ought to be placed in parallel rows, with a sufficient space between every two rows, for a cart to pass along, either to unload when building the ricks, or to load when taking them into the barn. Round the ricks, on the margin of the yard, there ought to be a space sufficiently wide for a loaded cart; and at the angles this space ought to be increased by the omission of a rick, in order to admit of the cart's turning round easily. All the ricks ought to be placed upon stands or saddles, so as to keep them dry and safe from rats and mice. These stands are of different kinds, some of which we shall notice.

809. *The Rick Stand* most common in countries where wood is the cheapest material is formed of oak pillars inserted in the ground, and standing two feet high above it, with a frame over them composed of joists of any cheap wood. The plan is round when the ricks are to be small and rectangular, and generally a parallelogram, when the ricks are to be large.

810. *The rick stand,* in wet climates, where the corn is frequently obliged to be carried before it is perfectly dry, has, in addition to the flooring of joists, a funnel, formed by a frame of wood, carried up from the flooring to the summit of the rick, passing, or at least which ought to pass, through it, and terminating in a light cap of sheet iron. The funnel is commonly not carried higher than two thirds of the height of the rick, but this often defeats the object in view, for, from the sluggish nature of air, it will not ascend freely unless it have a clear passage from the base of the stack to the summit; and therefore the funnels, to be efficacious, ought always to be carried through the thatch of the rick.

811. *The rick stand,* in countries where stone is more abundant than wood, and where central funnels are unnecessary, is frequently nothing more than a wall two feet high, of the size and shape of the intended rick, with a coping of stone or wood, projecting at least six inches over the wall outwards, to impede the ascent of vermin. The foundations of this wall should be a foot or more beneath the surface, to prevent vermin from burrowing under it. The interior space may be partially filled with earth or loose stones, according to the nature of the soil, keeping in view the importance of preventing the ascent of damp into the rick.

812. *The rick stand,* where cast and wrought iron are cheap materials, may be formed of cast-iron pillars set on stone plinths, with cast-iron copings and joists; and a cylindrical funnel of wrought-iron round rods held together at intervals by circular rods, and terminating in a cap above the thatch. Corn stands and funnels of this kind, but not carried through the thatch, and without the cap, are not uncommon in the iron districts of Scotland; having been first invented by Mitchell of Balquharn, near Alloa, in Stirlingshire.

813. *A square or parallelogram rick stand,* fig. 725, is manufactured by Messrs.

Cottam and Hallen. It consists of cast-iron pillars fig. 826, two feet six inches high, which cost 8*s*. 6*d*. each. Wrought-iron rods, *a*, six feet eight inches long, which cost 10*s*. each; secondary rods, *b*, six feet eight inches long, which cost 3*s*. 4*d*. each; and small rods, *c*, five feet six inches long, which cost 1*s*. 5*d*. each. The method of fixing the principal rods is shown in fig. 827; that of placing on them the secondary rods, *b*, in fig. 828; and that of fixing the small rods on these last in fig. 829. A square yard

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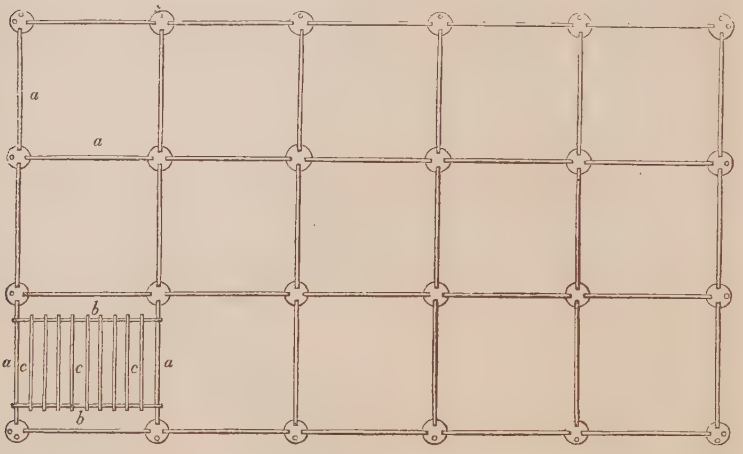

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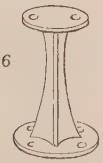

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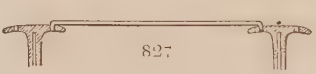

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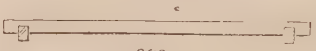

of this description of rick stand costs in all 12*s*., which may be considered cheap for an article which, if heated, and afterwards rubbed over with oil or tar, previously to being put up, will last many years.

814. *Waistell's circular rick stand*, fig. 830, is formed entirely of stone, and consists of two concentric circular walls; the outer wall is twenty inches high, to the top of the projecting flags; at about half its height, four grates of cast iron, about six inches square, and half an inch thick, are placed in openings left through the external walls, at equal distances from each other, to admit air. The bars of the grates are a quarter of an inch broad, and a quarter of an inch distant from each other, which is sufficiently close to prevent the entrance of mice. Stands thus constructed are considered, by those who have tried them, to be less expensive, and more effective, than on any other plan that has been invented. The air that passes through these four grates, and through the openings in the internal walls, will circulate freely under the rick; and, if a chimney be carried up the middle of the rick to its top, the current of air that will pass up through it will carry off the heat and moisture which might otherwise injure, and even spoil, such corn as was rather too moist when carried." (*Waistell's Designs*, &c. p. 101.) These rick-stands seem to have been invented by Mr. Waistell's nephews, who built the outside wall twenty inches thick, the inside wall eighteen inches thick, and left a distance between the two walls of eighteen inches. Across this space hedge-stakes or faggots were laid, sufficiently long to support the sheaves. The funnel in the centre, when necessary, need have no

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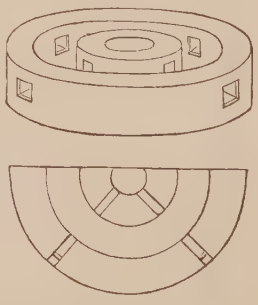
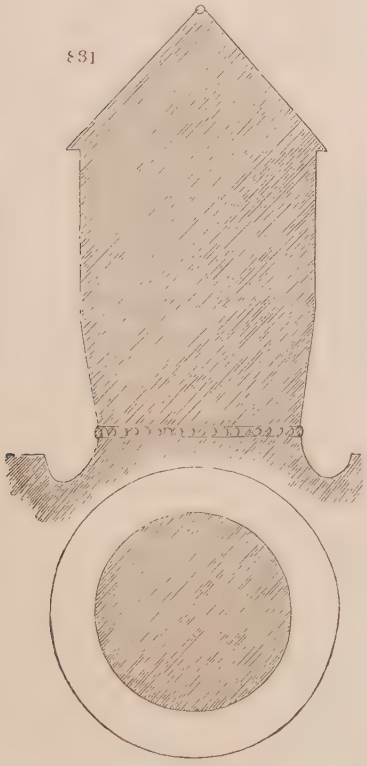


frame round it, but may be merely a circular opening, of two feet in diameter, left in building the rick.

815. *Morel-Vindé's rick stands* are of two kinds, one of which is circular and the other square, and both are calculated for containing 3000 sheaves. The circular rick stand, fig. 831, is twelve feet in diameter; and, to contain 3000 sheaves, the rick must be carried up to the height of twenty feet. It is surrounded by a ditch from two to three feet deep, the soil from which serves to elevate the stand or basis of the rick. On this is placed a bed of faggots, which is first covered with straw, and on which the sheaves are afterwards built in the usual manner. Morel-Vindé's square rick stand is called in France the American rick stand. It is formed of a square frame of carpentry, fig. 832, with a St. Andrew's cross in the middle, and is placed on five posts, each of which is furnished with a cone of tinned iron, in the form of an inverted basin, to prevent the ascent of vermin, as shown at *a a*, in fig. 833; on this frame are placed faggots and straw, and afterwards the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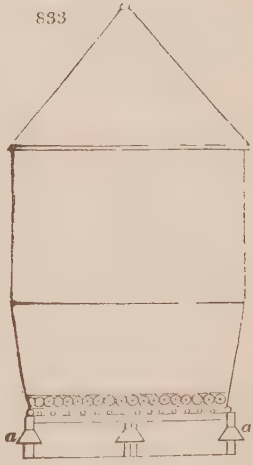

sheaves; and, when the sides are twelve feet high, this square rick, at that height, will contain 3000 sheaves.

816. *The Dutch rick stand* is made square in the plan, with a frame of wood, placed on five wooden posts, furnished with tinned iron cones, like the American rick stand; but it differs from it in having the corner posts, twenty-five feet high, tied together at top, so as to be there at exactly the same distance as at bottom, by horizontal rails, as shown in fig. 834; and further braced at top by two pieces in the form of a St. Andrew's cross, as shown in fig 835. The sheaves are built in the usual manner within the four posts; and in the centre of the under side of the cross of St. Andrew, at top, is fixed a pulley, to which is suspended a light roof, formed of deal, and covered with matting of drawn wheat straw, placed quite thin, or of oiled or tarred canvass, as shown in figs. 836 and 837. This light roof is raised and lowered at pleasure by means of the windlass *b*, in figs. 834, and 835 and a cord, which passes over a pulley placed on the top of one of the corner posts, as shown at *c*, in figs. 834 and 836. The rest of the construction of this rick stand will be sufficiently obvious from the figures. We agree with M. Morel-

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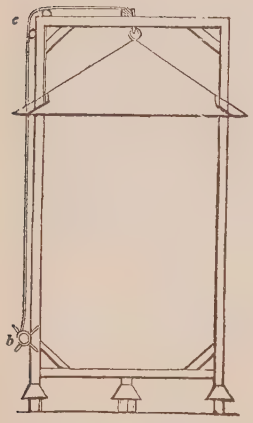

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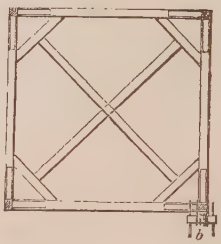

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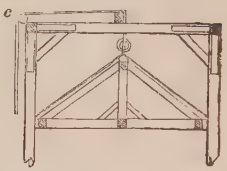

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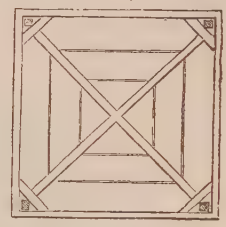

Vindé in thinking, that, as the great object of the farmer is to do the most at the cheapest rate, the common round or square rick stand, on posts, and without a roof, is the best. This is more especially the case where the barn is sufficiently large to contain a rick at a time. The Dutch, no doubt, contrived these ricks for very small farms, and small barns, where the sheaves were put on the rick by a few at a time, as they were harvested, and taken into the barn by degrees as they were to be threshed.

817. *The Hay-Yard* of a common country farm is generally much smaller than the corn-yard; because the horses and cattle eat straw of different kinds rather than hay. On grass farms, however, the hay-yard is often the largest. The same principles of form and arrangement are applicable to it as those laid down for the corn-yard, with this difference, that its position should be placed as near as possible to the stables, cow-houses, or such houses or yards in which it is to be chiefly consumed.

818. *The Dung-Yard* ought to be central to the stables and cattle-houses, for the reception of the dung produced in them as it is daily wheeled out. The common situation is the centre of the farmery, where it is enclosed by a wall, against which, in large farms, there are frequently open low sheds for cattle, and pigsties for swine. Both these animals, as well as poultry, are allowed the run of the yard over the dung, to which they do good rather than harm; the pigs and poultry by picking out grains and seeds, which would otherwise be lost, or spring up as weeds when the manure was spread on the land; and the cattle, by treading the straw into the moister part of the manure, and thus preparing it for being carted out and put into a dunghill for fermentation. The surface of the dung-yard ought to slope towards its centre, or towards one point which ought to be the lowest, and under which point there ought to be two capacious liquid manure tanks, with which all the drains of the stables, cattle-houses, piggeries, &c., ought to be connected. In this tank there ought either to be a pump constantly standing, or a hole for inserting one at pleasure, in order to admit of pumping up the liquid to moisten the straw of the manure, or into a barrel cart, for being carried off to form *urate*, or to apply at once to growing crops. In small farm-yards, where few or no cattle are kept loose in a central enclosure, instead of a dung-yard there is simply a dung-pit, into which all the dung produced in the surrounding houses is thrown, and into which all the gutters and drains (except those which are merely intended to collect rain or underground water) are to be directed. This pit ought either to be sufficiently deep to contain the liquid manure among the dung, or, what is far preferable, a liquid manure tank ought to be formed under it. All dunghills ought to be kept constantly covered with dry loose straw, to diminish evaporation by the sun and wind.

819. *The Poultry-Yard*, as we have already mentioned, § 770, should be in front of the poultry-houses, and should be divided into the breeding, rearing, and fattening yards. These ought always to face the warmest aspect, being well sheltered from cold winds; and the breeding-yard ought to contain a large pond for aquatic fowls. In most country farms the aquatic fowls are allowed to run at large over the farm, as being useful for picking up slugs, worms, tadpoles, &c., and even the common poultry are allowed the run of the dung-yard, rick-yards, and, in general, all that constitutes the farmery. The poultry-yards, therefore, are chiefly used for rearing, and, to a certain extent, for feeding in.

820. *The Carpenter's and Smith's Yard* is placed in front of the shops or work-places to which it belongs; and it ought always to be quite distinct from any of the other yards which have been already mentioned; particularly those containing straw, on account of the danger from fire. On the largest farms, in the most improved agricultural districts, a carpenter and a smith are kept constantly on the premises; and in those of a smaller size, these tradesmen attend one, two, or more days in a week, fortnight, or month, according to the size of the farm and kind of culture pursued. In either case, shops for these mechanics become requisite on the farmery; these shops and yards serve also as repositories for such articles as require repair, and for rough timber, hurdles, gates, bricks, lime, and other materials of construction.

821. *Passages* or roads are required, in large farmeries, between the yards and the houses, and these ought to be of such a width as to allow two carts to pass each other, and so rounded at the corners as to prevent any difficulty in turning. Their width, in general, should not be less than sixteen feet, and there should be as few gates across them as possible. As the surface water collected in the gutters of these passages is not intended to be conveyed to the dung-pit or manure tank, they should never be covered with litter, but kept as clean as any other gravelled, macadamised, or paved road.

822. *The System of Drainage* in a farmery is a matter of very great importance, and it ought to be determined on before any part is commenced of the yards, farm buildings, or farm house. There are three distinct systems of drainage which must necessarily exist in every well-constructed farmery: the first is the underground drainage of the natural soil, so as to render it perfectly dry beneath, and fit for serving as the immediate basis of the floors of the different buildings to be erected; the second is the surface drainage, for the removal of rain water from the roofs and passages; and the third the liquid manure drainage, for conveying the urine from the stables, cattle-houses, pigsties, &c., and the dung liquor from the hammels and yards, to the liquid manure tank. We shall offer a few words on each of these systems, for the guidance of the Architect.

823. *Underground Draining.* It seldom happens that the site for a farmery is so dry as not to require some underground drains around and through it, for carrying off the water that either sinks into the soil from the surface, and is retained there, or is found latent in the subsoil, or from some other cause. In making these drains, particular care ought to be taken that they be made so as to dry thoroughly the ground under the floors of all the houses; and, at the same time, neither in the houses nor in the yards to interfere with the underground gutters to the manure tank, so as to carry off any of the liquid manure. For this purpose, and also because their object is chiefly to carry off underground water, they ought to be deep, and they need not come within a foot or more of the surface. In general, one drain should surround the farmery, so as to intercept all exterior sources of water; and others should cross the farmery under the principal lines of buildings and roads or passages. The dung-courts will, by those lines, be rendered sufficiently dry for containing manure. As the drains under the passages, and in the rick and hay yards, will have to receive the surface water through traps, they ought to be barrel drains; but all the others may be formed of loose round stones of three inches in diameter at the bottom, four or five inches in the middle, and of the size of large gravel at top.

824. *Surface Drainage.* The water of the roofs should all be collected by gutters at the eaves; and, if not wanted for a well, tank, or pond, it should be conducted direct to the underground drains. The water which falls in the passages, roads, courts, or yards not covered with litter, and more especially in the rick-yard, ought to be collected in gutters, and also conveyed direct to the underground drains, through air traps. These traps ought to be of such a construction as to retain the sand and grosser particles, which might choke up the drain, and also to admit of being readily cleaned out. There are various forms very suitable for this purpose; but one of the cheapest and best at present in use is the iron one of Messrs. Cottam and Hallen, shown in the perspective view fig. 838, which weighs 4 cwt. 19lbs. and costs 50*s*. In this figure, and in the section, fig. 839, *a* is the level of the water, on both sides of the trap, *b*; *c* is the opening by which the water escapes; and *d* the place where the sediment is deposited. The grating at top, *e*, lifts off; when this sediment is to be removed. Gratings of this kind ought to be placed all along the gutters, at distances of thirty or forty yards; in order that no great accumulation of water may ever take place on the surface. The grating being hollow in the middle indicates that the direction of the bars ought to be across the line of gutter; their strength is sufficient to bear the pressure of the most heavily laden waggon. The contents of all the underground drains about a farmery should be conducted to a pond where they may be rendered available for the purpose of the surface irrigation of grass land; for, notwithstanding all ordinary care and attention that may be given, to prevent the water collected from the surface by these drains from being mixed with manure

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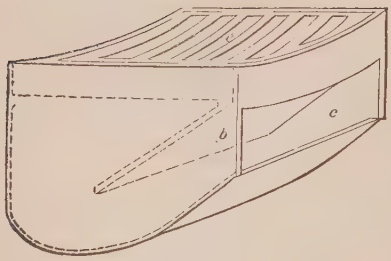

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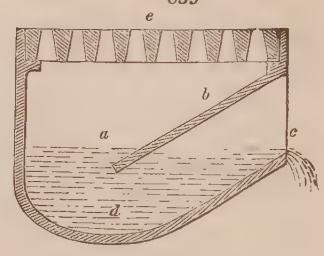

liquor, some, if only from the droppings of horses and poultry on the passages, will find its way into it.

825. *Underground Gutters for Liquid Manure.* In general, there ought to be a cess-pool, or liquid manure tank, in the centre, or in the lowest part of every dung or cattle yard, or yard which is intended to be kept generally covered with litter; or where a number of small yards, such as those of hammels, are to be placed together, one tank centrally situated may have communications with the whole. The inclination of the surface of every part of every yard should be to the cess-pool, or to the trap of the drain communicating with it; and the underground drains from the cattle-houses, stables, piggeries, &c., should always be conducted to the nearest cess-pool. These underground drains or gutters need neither be large nor deep, and may in general be formed of brick earth draining-pipe of three or four inches in diameter. To prevent the possibility of a current of air passing through these pipe drains, the end which enters the cess-pool may either have a trap there, or be carried down the side walls to near the bottom of the tank, so as always to be filled with water at their orifice. This is easily done by carrying up the requisite number of funnels in the side walls of the tank, from the bottom of the tank to the bottom of the drain, as shown in the section, fig. 840, in which *a* is the bottom of the tank; *b*, the funnel left in its side walls; *c*, the conducting drain or draining-pipe; and *d*, the surface of the ground. These manure drains, when formed of earthenware piping, may be laid a foot under the surface, and protected by side walls and an outer cover of stone, to prevent them from being injured by the wheels of carts or waggons; or they may be sunk two feet into the ground, in which case they will be safe without any protection. The manure tank should, as we have before mentioned, § 16, always be in two divisions, that one may be fermenting while the other is filling; and there should be a pumphole in each. Were it not for the expense, we should recommend the dunghill in farmeries to be always covered with a roof, close down to the ground, to prevent evaporation, which, in all cases where the dung is not enveloped in a thick covering of dry straw, as before recommended, § 818, carries off the most nutritive part of the manure. The present clumsy mode of making manure, at a great loss of material, and at a considerable diminution of the comfort of cattle and other animals, is unworthy of an age of science and refinement, and, we have no doubt, will soon be reformed. We see no reason why the straw should be trodden by cattle at all; if it were placed in layers from time to time under a roof, over the manure tank, and the liquid beneath pumped up over it, such solid manure as was made in the stables and cattle-houses being added daily, the manure produced would be as good as if the straw had been trodden by cattle in a yard or in a cow-house; while the loss which that practice occasions, by evaporation and by what sinks into the soil, would be saved, and the cattle preserved clean, and better in health, as well as more agreeable in appearance. The mode of feeding cattle with straw is also in its infancy. We are persuaded **that it**

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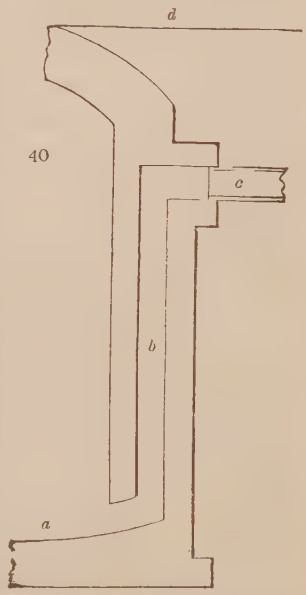

would pay a farmer to have his straw cut by a machine into lengths of three or four inches; and afterwards to have it boiled or steamed, and mixed with a portion of succulent food of some kind. For litter and thatch the larger and stronger the straw is kept the better; but both for eating and for manure it would be more easily managed if cut into short lengths. The science and the art of making manure are alike unknown to the great majority of even the best British farmers, and will be so till they learn something of chemistry. In every farmyard, at present, it may safely be affirmed that there is nearly as much manure lost as made. A liquid manure tank, connected by underground tubes with the back-kitchen, and kitchen-court, with all the privies, and with all the houses or yards in which cattle are kept, in short with every source of water impregnated with animal or vegetable matter or with any of the alkalies, would alone, on a large farm, supply manure for several acres yearly. Even supposing the manure tank not to be adopted, the mere circumstance of placing all the dung made on a farmery in one dunghill under a roof, where its more valuable parts would neither be washed away by the rain nor carried off by the sun and wind, would be an immense saving. We say nothing here of other sources of manure, such as stall-feeding, which ought to be universally substituted for grazing, &c. We strongly recommend the subject of employing manure tanks and dunghill roofs to the land stewards of country gentlemen, and to scientific agriculturists, and rural Architects generally.

826. *The Liquid Manure Tank*, to be generally adopted, ought to be of a very simple construction; for which purpose a square or a parallelogram plan, with perpendicular side and end walls, and a semicircular arch over, with a manhole in the centre for the pump, and for entering to clear out the interior, may be recommended as of easy erection by any country bricklayer or mason. The walls may be built with common mortar, provided they are well puddled behind with clay; but cement will make the strongest work, and will render a clay puddle unnecessary. In some parts of Germany, where timber is abundant, the liquid manure tank is made ten or twelve feet wide, about the same depth, and is covered with joists of wood, on which first coarse litter, and afterwards the stable and cattle dung, are put as made.

827. *Gates* for farmyards and fields are commonly treated of in works on Farm Architecture; and a very excellent wooden one is given by Waistell, which we have copied in our *Encyclopædia of Agriculture*. We shall here, therefore, confine ourselves to two very strong and cheap iron gates, and to a mode of opening gates, which, though chiefly applicable to gates on public roads, may also be occasionally adopted with entrance gates to farms, or farmeries.

828. *Buchanan of Catrine's Field or Farm Gate*, fig. 841, on a scale of five sixteenths of an inch to a foot, is composed of a frame or rim of bar iron, seven feet long and four

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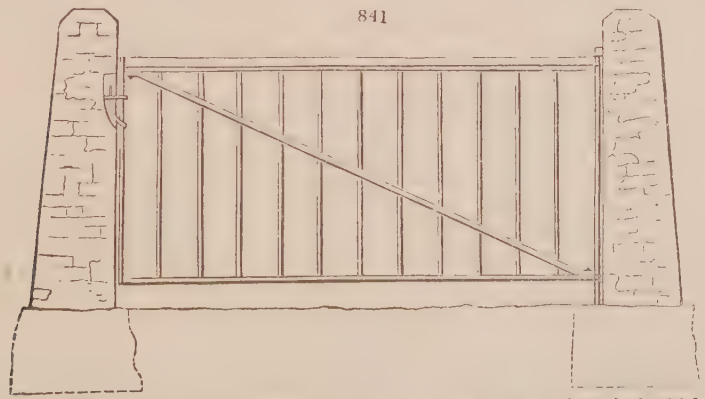

feet high, one inch and three quarters broad, and three eighths of an inch thick, not riveted, but welded at the angles, and the rim presenting its edge to the face of the gate. The head style and the falling style are each projected about three inches above the rim, for the purpose of retaining a horizontal rail of wood, about three inches by two inches, placed on the top bar, in order to render it more conspicuous to cattle than the narrow edge of the top of the iron rim. The diagonal strutt or brace is of the same breadth and thickness as the surrounding rim, to which it is firmly riveted at both extremities. The vertical round rods are eleven; six of them are three quarters of an inch in diameter, and five are five eighths of an inch; they are riveted into the top and bottom rails, and firmly fixed into the brace, by being put through it cold while the brace is red-hot. The

hanging post is continued down nine inches at bottom, so as to form a pivot for working in a socket fixed in a stone; and up, so as to turn in a hook. The shutting post admits of the application of any description of fastening; one of the best for a cattle-yard, to which this gate is particularly adapted, is a spring latch, which shuts into a recess in the falling post, as seen in the figure. These gates are manufactured in the workshops of the inventor, at Catrine, and the prime cost, in 1831, was found to be about 30*s*.

829. *Cottam and Hallen's Iron Field Gate*, fig. 842, is made of wrought iron, the horizontal bars and braces being made of flat bar iron, riveted together at every intersection, in order to prevent the swagging or sinking of the head or falling style. The lower rails are placed sufficiently close together to prevent pigs and lambs from passing through between them. This gate can be supplied, singly, for 26*s*. each, and by the dozen 10 per cent lower. Mr. Cottam considers this gate stronger, more durable, and far more economical, than any gate which can be made of wood.

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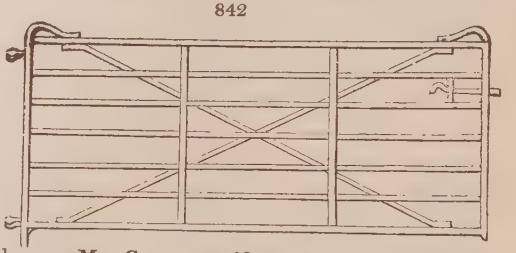

830. *The Closeburn Field Gate* is the invention of C. J. Stuart Menteath, Esq., and of which he has lately sent us a sketch, fig. 843. The material is timber; the construction is very light and strong, and so economical that it may be made in some parts of the country, where young fir trees are abundant, for 7*s*. When the head sinks, it is raised by the simple operation of adding another washer between the key, and that which retains the hook of the upper part of the hanging style at *a*. The fastening latch is protected from the rubbing of cattle, by being made to shut into a recess in the falling post at *b*. When gates of this sort are made of young timber, it is, after being sawn up, steeped in lime water, which is found to add to its durability; and, when well seasoned and put together as a gate, it receives three coats of boiling hot tar.

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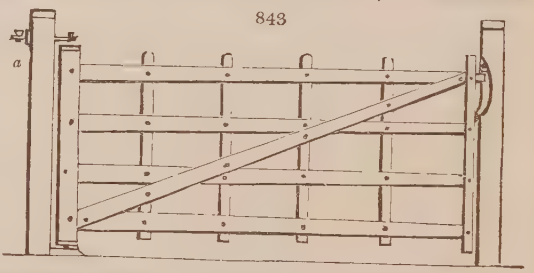

831. *Gates to open by Machinery.* One of these, for a park or farm, made to open on the approach of a carriage, will be found in our *Encyc. of Agr.*, § 3107; and we shall here describe two others; one of which is used as a turnpike gate at Scotforth, in the neighbourhood of Lancaster, and the other is the invention of our correspondent, Mr. Saul, of that town. Mr. Saul has sent us the following account of the mode of opening the gate at Scotforth. In fig. 844, *a a* represent two fixtures; each consisting of two posts, with rollers between, for guiding the chains *b* and *c*. The chain *b*, fixed to the lower bar of the gate, is the opening chain; and the chain *c* is the shutting one. There is a continuation of these two chains in tunnels under the road, represented by the dotted lines *d d*; and both chains pass under a roller at *e*, after which they rise through a wooden tube to *f*, in the sleeping-room of the toll-house. They are there worked by a winch, which being turned one way opens the gate, and the other way shuts it. Mr. Saul was informed by the gatekeeper that this gate did not work freely; and he has suggested what is obviously a far more efficient plan, of which he has given us an explanation, accompanied by the sketch, fig. 845. In this figure, *g* represents a horizontal shaft placed in a tunnel made across the road directly under the gate; working at one end on the heel of the hanging post by a pinion at *h*, and at the other by a beveled pinion at *i*, on the upright shaft *k*. This shaft has another pinion at its upper end, which works into the pinion *l*, on the axle of the winch *m*, supposed to be at the bedside of the gatekeeper. It is evident that, by turning this winch, the gate may be opened or shut to any extent at pleasure. The whole of the machinery may be concealed under ground, and in the wall of the house; the winch alone protruding into the bed-room of the gatekeeper. Any millwright could easily make a working plan from the above description and sketch. It may sometimes be worth while to have the principal entrance gate to a farm-yard constructed so as to open in this manner, and the use of the contrivance for toll gates, and for the coach-yard gates of inns, is obvious. We hope also that the time is not far distant

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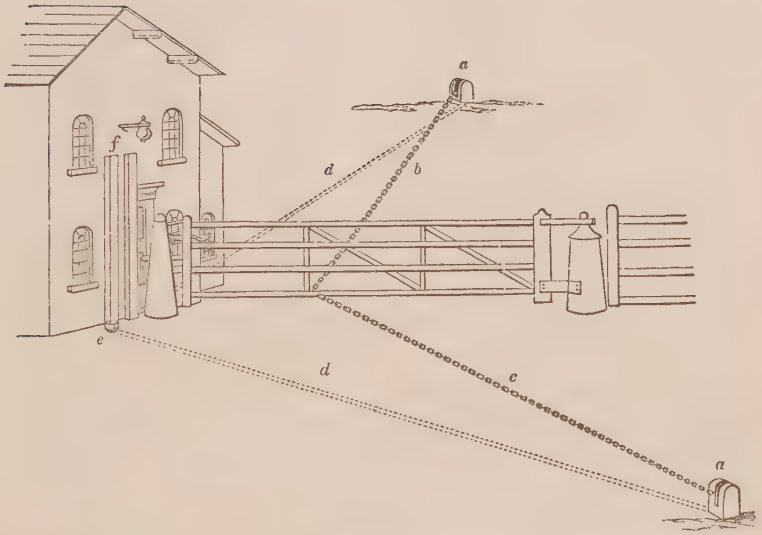

when the occupiers of mansions, whose approach roads are guarded by entrance lodges and gates, will so far study the comforts of their gatekeepers as to introduce this piece of mechanism, or something better, to prevent the necessity of their getting out of bed to

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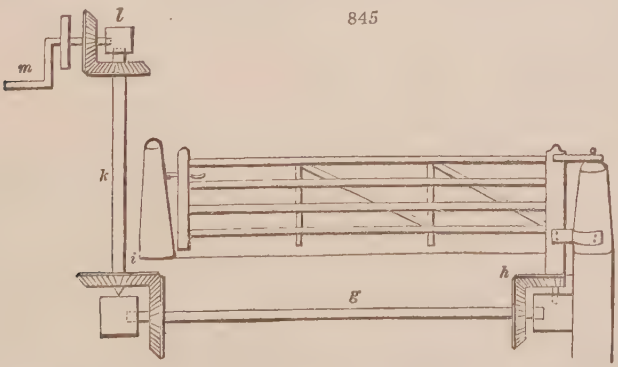
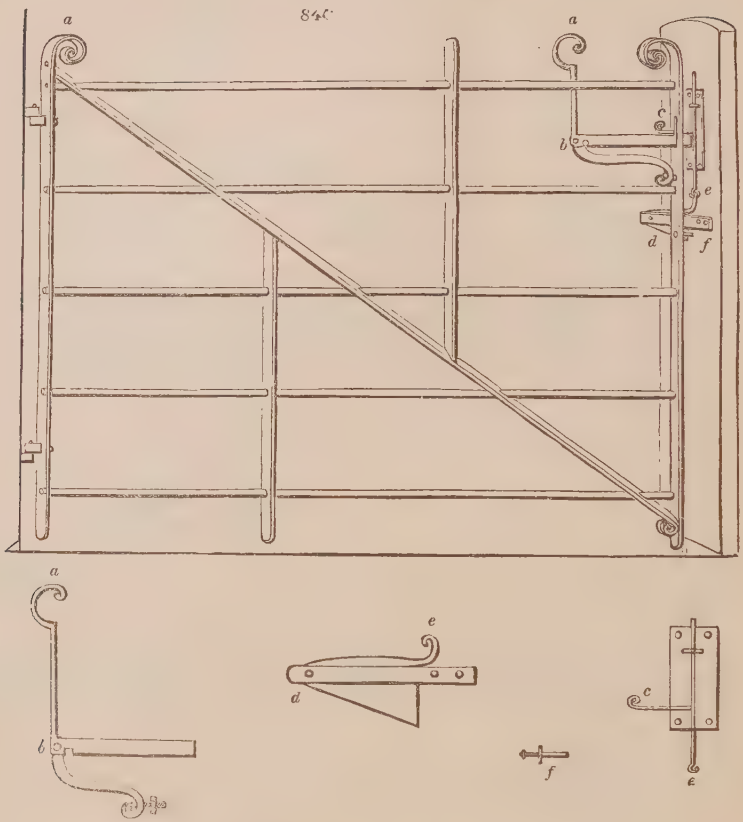


open the gate in the night-time. In Germany the toll-bar or beam (schlagbaum) is balanced by a weight at one end, and the other is held down by a cord, which passes under one pulley and over another into the bed-room of the gatekeeper; who, without rising from his bed, pushes out through a small opening a long-handled iron ladle, in which he receives the toll, and, afterwards untying the cord, the weight raises the bar, and the traveller passes through.

832. *A Gate with a Puzzle Latch, to serve as a Substitute for a Lock*, fig. 846, is in use on the estate of R. Bevan, Esq., Rougham, Suffolk, and the following description of it has been sent us by Mr. John Levett. The latch, *a*, is fastened by a brace, with a screw bolt and nut to the head of the gate, and it works on the joint *b*. When this latch is drawn back by pressure on the top of *a*, it raises the rod *c*, which is connected with the catch *d* at *e*. The catch *d* being now raised, the pin *f*, fixed in the head of the gate, is allowed to pass, and the gate is opened. The catch *d*, and plate for the rod, marked *c*, are fastened to the post with four screw nails and two screw bolts.



Subsect. 3. *The Farmery considered as a whole.*

833. *The Farmery, as a whole,* may be considered with reference to its situation on the farm; its extent and character relatively to the size of the farm, and to the kind of culture pursued or of crops raised; its position relatively to that of the farm house; the style of its architectural design; and the materials of its construction.

834. *The Situation* of every farmery ought, as far as practicable, to be in the centre of the farm; because this will reduce the labour of carting home produce, and carting out manure, to a minimum. When the surface of a farm is very irregular, or where it consists of the sloping side of a hill, the site of the farmery should be chosen at that point of height in the slope where the extra-labour of carrying home the crop will always be balanced by the extra-facility of carting out the manure; and where, as much as possible, the labour of the two operations may be equalised. The most difficult case for choosing a proper site for the farmery is where the lands lie on the two sides of a valley: here there is no choice but that of placing the farmery in the valley, and laying out the fences, roads, and even ridges of the fields, in directions athwart the slopes, so as to diminish all the farm labours to the extent of one half of what they would be by ascending and descending in straight lines. All labours with ploughs, carts, or waggons, and even harrowing, and the manual labours of hoeing and reaping, may be diminished on this principle. In laying out farmeries in all old countries which have been long interected by hedges and roads, and the boundary lines of all landed property in which is exceedingly irregular, numerous cases occur where true principles must give way to circumstances; and all that the Architect can aim at is, after weighing well the arguments for and against particular situations, to make choice of that which has a maximum of advantages. Our intelligent contributor, Mr. Main, has paid much attention to this subject, and has sent us the following observations: — "Proximity to a high road, to a natural pond, or to the summit of a dry knoll, in order to be free from floods, is an advan-

tage which is never disregarded by the British farmer; but, for the sake of these, we often see others of much greater importance wholly neglected. If the buildings are on the highest ground belonging to the farm, it follows that carting out manure from the yards must be facilitated; but that, on the other hand, all the produce will have to be carried up-hill; and if, for the sake of water, the homestead be placed in a valley, that these circumstances will be reversed. A gentle eminence, near the centre of the farm, is, on all accounts, the most eligible, provided only that water can conveniently be had near it; but, now that the practicability of obtaining water by boring, in almost any situation, has become so well known, no homestead need be wrongly placed merely on that score. Some old homesteads are badly arranged in other respects; such as placing them across public footpaths or bridleways; in which case gates are frequently left open by careless passengers, and much damage is often sustained by the straying out of cattle, &c. There are even instances of farm houses standing on one side of a turnpike road, and the barns and yards on the other; but surely accident, and not design, must have produced such absurdities."

835. *The Size of the Farmery, and the Kind of Buildings which compose it,* must necessarily be regulated by the extent of the farm, and by the kind of culture pursued on it. A farm wholly arable will obviously require different buildings from one chiefly in pasture; and an arable farm, on a strong alluvial soil, on which wheat, beans, and clover are chiefly cultivated, will require different buildings from a farm on a light soil, on which turnips form a principal article in the succession of crops; and, consequently, extensive cattle-sheds are required for lodging the cattle to consume them. On this subject Mr. Main observes: — "The size of a farm regulates the extent and number of the buildings belonging to it. The lowest grade of farmeries has only a dwelling-house of two or four rooms, with a small barn on one side, and a cow-house and stable on the other. A front fence (generally carried across from the outer end of the stable to that of the barn) forms the yard. The rick-yard is behind the barn, and the orchard and garden are behind the stable and dwelling-house. The carts or waggons, when not in use, are usually kept loaded with straw to preserve them from the weather; pigsties lean against the end of the house or stable; and the whole is on a very homely and limited scale. Such a homestead is only fitted for a farm of from forty to sixty acres. Large farms require buildings in proportion. Those belonging to a farm of 500 or 1000 acres appear like a little town. In arranging these buildings, it should always be contrived to have all the barn doors and cattle-yards in view from the dwelling-house. The superintending eye of the master, or of some of his family, assists the vigilance of servants, and accidents among the live stock are sooner observed and prevented, or remedied. Another point, in disposing the buildings, should be, to have the lowest on the south, and the highest on the north and east sides, for the purpose of shelter to the yard. Where the buildings are insufficient for the purpose of shelter, closely planted ranks of spruce firs are available. A horsepond is generally supposed to be a desirable appendage to a farm yard: but a pump and trough in the yard are far more suitable. Cart horses are liable to greasy heels; and the having their legs wetted in the pond causes irritation, which they generally indicate by constant stamping for an hour or two afterwards; and this is sometimes attended with dangerous wounds, loss of shoes, &c. The pantry and dairy are always placed on the north side of the house. The latter, on a dairy farm, is usually a large clean room, with a stone floor, four or five feet below the surface; and a ceiling lofty and plastered. At one end, on the ground surface, is the churning and scalding room; and on the outside of this, next the yard, are the hog-cisterns, for the reception of the whey, skim-milk, &c. It is an advantage to have barn room enough for every crop, especially in climates where the corn is quickly and thoroughly dried. But in cold humid districts of country, it is absolutely necessary either to have Dutch barns, or covered rick stands, § 816, or to set the corn abroad in small cocks, thatched, to receive the sun and wind for several months before housing. Agriculturists are generally of opinion that a well-proportioned farm should consist of one third of meadow and pasture ground, and two thirds of arable land; because all the advantages of the plough and the hoof will thus be so well balanced, and each will assist the other so beneficially, that there need be neither redundancy nor waste of any of the produce; but all may be turned to the best account in the shortest time. In grazing farms, the above proportions are reversed; one third of arable land being considered necessary to supply litter for the cattle, and straw for thatching ricks, &c. The buildings on such farms are also different; as, instead of barns, they have extensive feeding-houses." We might enlarge on this subject at great length, from the circumstance of having been early initiated in farming under our parental roof, and having since farmed extensively on our own account, as well as from having designed several farmeries, and executed some of them: but having already treated on the subject in detail, in our *Encyclopædia of Agriculture*, we purposely refer the reader to that work; being desirous of not repeating any part of it in the present one, and of saying no more on

the subject of agriculture than what is absolutely necessary to put the Architect in possession of the requisite data and desiderata of the buildings which he will be required to design.

836. *The most desirable Position of the Farm House, relatively to the Farmery*, has already more than once (see § 740 and 741) been incidentally mentioned; and it is only necessary to repeat, that it should always be such as to command as complete a view of the yards and the doors of the buildings as possible. For this purpose, when the living-rooms of the house have windows on two sides, as in fig. 749, § 740, the diagonal of the square of the house ought to be parallel to the square of the farmery; but when the parlour or living-room has windows only from one side, its front may be parallel with the front of the farmery. On whichever side of the farmery the house is placed, the buildings or walls on that side should always be so low as to be overlooked by the dog-house and the windows of the parlour.

837. *The Style of Architectural Design, in Farm Houses and Farmeries*, may be considered in two points of view: first, with reference to the nature of the buildings; that is, their magnitude, shape, materials, and uses; and, secondly, with reference to the other buildings of a superior character, when there are such on the estate to which they belong. Grecian architecture is best suited for low extended buildings, and for buildings constructed of timber, and abounding in piers and posts; and Gothic architecture is best calculated for lofty buildings of stone, without detached outside piers, posts, or pillars. The prevailing lines in Grecian architecture are horizontal, and lead the eye along the eaves of the roof; the prevailing lines in Gothic architecture are perpendicular, and lead the eye upwards, by long, narrow, upright openings, and high gables. A Gothic building of one story produces no effect, because there is no room for the extension of its characteristic lines; but a low Grecian building may have the full measure of its characteristic expression by extending its length. It is clear, therefore, that the Grecian style is better adapted for farm buildings than the Gothic style; and that, if expense were not an object, the piers and posts of a farm yard might be, with propriety, finished as Grecian columns and pilasters; and open cattle-sheds and cart-sheds might show the noblest colonnades, arcades, and piazzas. On the other hand, when the mansion, or château, or convent, or college, or school, to which the farm belongs, is in the Gothic style, there is a propriety in yielding to accidental circumstances, and conferring the same character of style on the farm buildings. As this cannot be done by general forms, since it would be useless to carry stables and cattle-sheds three or four stories high, it is to be attempted chiefly by the character of the openings, and by highly raised roofs. the barn may have something of the forms and proportions of a cathedral; the cart and cattle sheds, of cloisters; and the stables and cow-houses, of lodgings for monks, like those common in old monasteries. We throw out this idea respecting the Gothic style more in conformity with the taste of the times than with our own, which in every case of farm buildings is in favour of the greatest simplicity of design, and of the indication of the Grecian style rather than of any other.

838. *The Materials with which Farm Buildings are constructed* are commonly those which are most abundant in the given locality. As the improvements which are constantly taking place in agriculture necessarily occasion changes in the buildings for storing or consuming its produce, it does not seem essential that the constructions on a farm ought to be of the same degree of durability as those for a dwelling-house or for a public building. Indeed, as society advances, change will enter more and more into every thing, and almost the only buildings that will eventually require to be made of great durability will be those of a public nature; such as bridges, which ought to be the most durable of all architectural constructions, piers, quays, sewers, public offices, parochial schools, &c. As the walls of the greater part of farm buildings have no weight to support but the roof; as the retention of a high temperature within is seldom, if ever, an object; and as scarcely any fires are requisite, timber seems a very suitable material of construction; and in all countries where wood abounds it will be found the cheapest. The objection hitherto has been the want of durability, but this evil may be in a great degree remedied by raising proper footings of masonry, as basements for the framework of the walls; by thoroughly seasoning the timber before it is used; and by coating it over, after it is put together, with tar, or some description of paint or other adhesive material, which will effectually exclude the air and the weather. Walls of mud, or of compressed earth, are still more economical than those of timber; and if they were raised on brick or stone foundations, the height of a foot or eighteen inches above the ground, or above the highest point at which dung or moist straw was ever likely to be placed against them, their durability would be equal to that of marble, if properly constructed, and kept perfectly dry. The cob walls of Devonshire, which are formed of clay and straw trodden together by oxen, have been known to last above a century without requiring the slightest repair; and we think that there are many farmers, especially in America and Australia,

who, if they knew how easily walls of this description could be built, would often avail themselves of them for various agricultural purposes. We shall therefore here describe the Devonshire practice, as furnished us by the Rev. W. T. E———, who has himself built several houses of two stories with cob walls, in the manner which he details in the following paragraph; and who, moreover, informs us that he was born in a cob-wall parsonage, built in the reign of Elizabeth, if not a few years earlier, which was only taken down last year (1831) to be rebuilt.

839. *Cob Walls*, as they are called, are composed of earth and straw mixed up with water like mortar, and well beaten and trodden together. Chapple, in his *Survey of Devon*, 1785, derives *cob* from the British word *chwap* (*ictus*), or from the Greek κοπτος (*contusus*), because the earth and straw ought to be well beaten or pounded together. The earth nearest at hand is generally used, and the more loamy the more suitable it is considered for the purpose. These walls are made two feet thick, and are raised upon a foundation of stonework. The higher the stonework is carried the better, as it elevates the cobwork from the moisture of the ground. After a wall is raised to a certain height, it is allowed some weeks to settle, before more is laid on. The first rise, as it is called, is about four feet; the next not so high; and so every succeeding rise is diminished in height as the work advances. The solidity of cob walls depends much upon their not being hurried in the process of making them; for, if hurried, the walls will surely be crippled; that is, they will swag, or swerve from the perpendicular. It is usual to pare down the sides of each successive rise before another is added to it. The instrument used for this purpose is like a baker's peel (a kind of wooden shovel for taking the bread out of the oven), but the cob-parer is made of iron. The lintels of the doors and windows, and of the cupboards or other recesses, are put in as the work advances, (allowance being made for their settling), bedding them on cross pieces, and the walls being carried up solid. The respective openings are cut out after the work is well settled. In Devonshire, the builders of cob-wall houses like to begin their work when the birds begin to build their nests, in order that there may be time to cover in the shell of the building before winter. The outer walls are plastered the following spring. Should the work be overtaken by winter before the roof is on, it is usual to put a temporary covering of thatch upon the walls, to protect them from the frost.

840. *In forming cob walls*, one man stands on the work to receive the cob, which is pitched up to him by a man below; the man on the work arranging it and treading it down. Each workman generally uses a common pitchfork, though sometimes a three-pronged fork is employed. Cob houses are considered remarkably warm and healthy; and they are generally covered with thatch. The durability of cob is said to depend upon its having "a good hat and a good pair of shoes;" that is, a good roof and a good foundation. The Devonshire thatching is very superior to that in most other parts of England. It is done with combed wheat straw, called reed, consisting of the stiff, unbruised, and broken stalks, which have been carefully separated from the fodder straw by the thresher, and bound up in large sheaves called nitches. In this way the thatcher is enabled to finish his work much more neatly than in other counties where no reed is made. Instead of brick nogging for partitions, cob is used for filling in the frame-work, which is previously lathed with stout slit oak or hazel. This sort of work is called rab and dab.

841. *Cob walls thatched are very common for garden boundaries.* The trees are trained against them by being pinned with maple hooks; but such walls in the course of time become full of holes, and afford a hiding-place for insects; they, therefore, frequently require a fresh coating of plaster.

842. *In estimating the merits of cob walls*, it must not be forgotten, that, when pulled down, the materials are good for nothing but as manure; whereas the materials of brick, stone, and sometimes even of timber walls may be used in rebuilding. It also deserves to be remarked, that earth or mud walls are not in use in any district of Britain which is in an advanced state of improvement; they appear to be chiefly suitable to a rude state of society, where every man is his own builder, and where mechanical skill, and good tools for working in timber and stone, are scarce. However, though they cannot be recommended for general adoption where brick and stone walls are common, yet the very circumstance of their being neglected, or not known, in such places, renders it probable that a great economy would be produced by their occasional use; on the same principle that, in a country where the common labourers live on bread and butcher's meat, one of them who should determine to subsist merely on oatmeal or potatoes would save money.

843. *For covering the Roofs of Farm Buildings*, the cheapest material will generally be the straw raised on the farm, which, when laid on thick, and with a steep slope, lasts many years. The spray of trees previously well seasoned, hoop chips, and the chips from other articles made of coppice wood, form more durable materials for thatching with than

straw, and we think they might be more used than they are, with advantage. Nevertheless, thatched roofs have disappeared with the improvement of agriculture in all the more advanced districts of Britain, and have given place to tiles and slates. It would appear, therefore, that mud walls and thatched roofs, like the practice of using oxen in field labours, notwithstanding all that is said in favour of the former for excluding extremes of temperature, and of the latter as combining a working with a beef-producing animal, are fast falling into disuse. Our own opinion, with respect to thatched roofs, is, that in very many cases they are preferable, both for farm buildings and cottages, to roofs of tiles or slates, as these are commonly constructed, even where the latter two are cheaper, because they are less liable to admit through them the influence of every change of temperature.

844. *For Details of Construction* common to buildings in general, we refer to that part of this work which treats of the practice of building; or the Architect may consult Waistell's very excellent chapter (v.) on this subject.

Chap. II.

A Miscellaneous Collection of Designs for Farm Houses and Farmeries, in different Styles of Architecture, and adapted to different Kinds of Farms; with Specifications, Estimates, and accompanying Remarks.

845. *The following Designs* exhibit various combinations of the separate buildings, courts, and yards which compose a farmery; and exhibit also farm houses with different degrees of accommodation, from those of the gentleman's bailiff, and of the rent-paying occupier of a hundred acres, to that of the wealthy proprietor who cultivates his own estate. Though there is little room for a display of style in the necessarily simple form of farm buildings, yet we shall endeavour to show in what manner style may be introduced even in the humblest of them; because the farm house is as susceptible of architectural design as any other dwelling; and when it is in the same style as that of the farmery, it gives a first impression, which should be found to be echoed, as it were, through all the subordinate buildings. With respect to the arrangement of these Designs, it is enough to say, that, like those of the cottage dwellings in the preceding Book, it is miscellaneous.

Design I. — *A Bailiff's Cottage, in the Old English Style, intended for the Manager of a Farm in the Neighbourhood of London.*

846. *Situation.* This dwelling, which has been erected at Bury Hill, near Dorking, Surrey, the seat of Charles Barclay, Esq., was designed by John Perry, Esq., architect, Godalming, and executed by contract, in 1831, under his direction. It is situated on the south side of the farm yard, which will form the subject of our next Design, and of which the bailiff has the management. We were shown the house and the yard by Mr. Barclay, in October, 1831, and were so much gratified with both, that we requested his permission to publish Designs of them. This permission he kindly granted; and, by the liberality of our excellent friend, Mr. Perry, we are here enabled to give them, with the most ample details of construction, and with the original specifications and estimates signed by the contractors who executed the work.

847. *Accommodation.* The ground floor, fig. 847, p. 419, contains a porchway, *a*;

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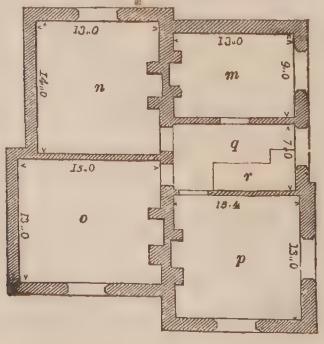

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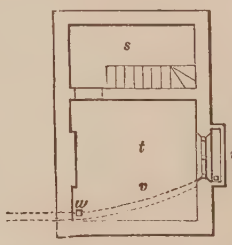

hall and staircase, *b*; parlour, *c*; pantry, *d*; store room, *e*; dairy, *f*; scalding-room, or dairy scullery, *g*, containing a pump, *h*; oven, *i*; drying-room, *k*; and terrace, *l*. The

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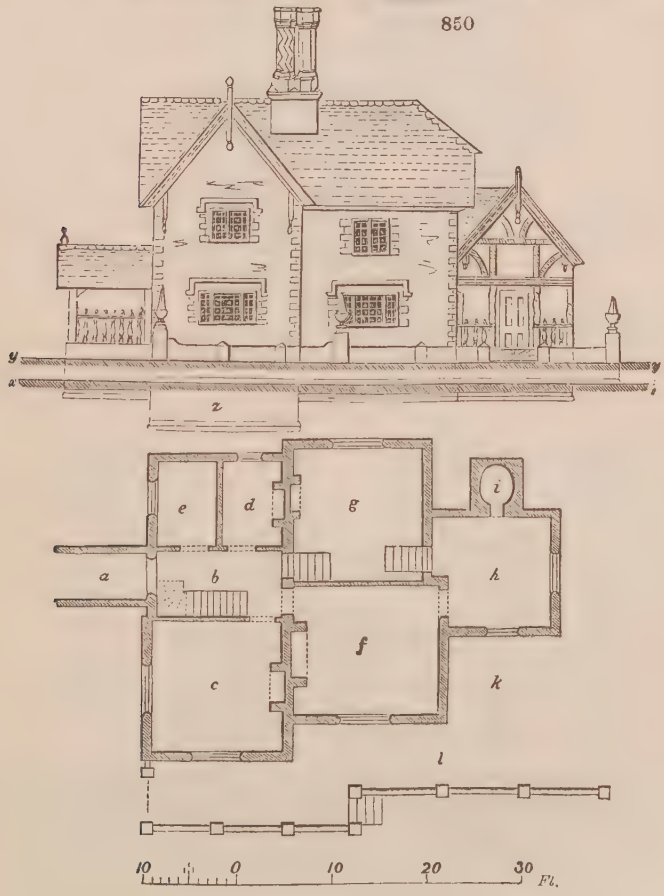

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chamber floor, fig. 848, to a scale of twenty feet to an inch, contains four good bed-rooms, *m*, *n*, *o*, *p*; each with fireplaces, and all commodiously entered from the landing, *q*, of the stairs, *r*. The basement story, fig. 849, to the same scale, contains an outer cellar, *s*, and an inner cellar, *t*. There is an area, *u*, to the kitchen window, with a trap over a drain, *v*, which is conducted under the cellar floor; in one corner of which, another trap, *w*, is placed over it, for carrying off any moisture spilled in the cellar.

848. *Construction.* The walls are of local sandstone, in random courses, with brick arches and coins; and the window sills, lintels, labels, and chimney shafts are of Bath stone. The posts of the entrance and drying porches, are of oak and the superstructure of the drying-porch is of framed oak, filled in with brick nogging flat, as shown in the elevation of the south front, fig. 850, p. 419. The roof is covered with plain tiles. The different elevations are shown in p. 420; fig. 851 being the north front, fig. 852 the east front, and fig. 853 the west front. The ground floor is raised three feet six inches above the general surface, and the terrace three feet; as shown in the different elevations, by the line *x*, which represents the solid ground, as compared with the line *y*, which represents the surface of the terrace. The cellar is shown at *z*, in fig. 850, p. 419, in fig. 853, p. 420, and in fig. 854; the latter being a section across the cellar, *z*; the

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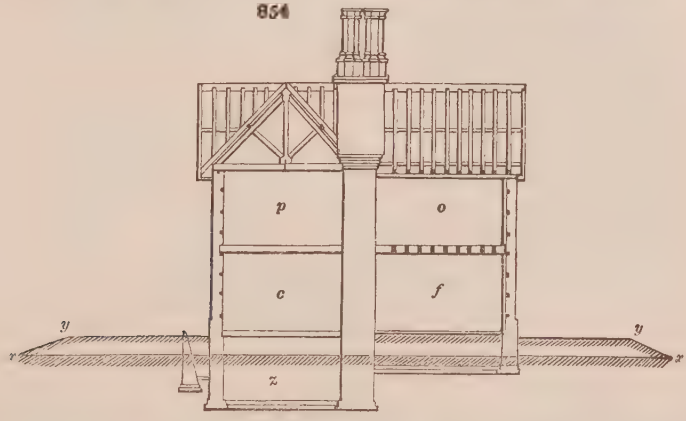

parlour, *c*; the kitchen, *f*; and the bed-rooms, *o*, *p*. The foundations and their footings are distinctly seen in this section, and in the different elevations.

Fig. 855 is an end view of the drying-porch, and fig. 856 a side view of the same;

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both to a scale of one eighth of an inch to a foot. The columns here, it will be observed, are twisted; a practice not unfrequent in old English cottages of the better kind, and which is in perfect accordance with the enriched barge boards and the turned balusters of the balustrade.

Fig. 857 shows the plan of the drying-porch.

Fig. 858, to a scale of one inch to a foot, is a section across the balustrade, in which *a* is the top rail, and *b* the bottom rail.

Fig. 859, to the same scale, is a section of the moulded face of the beam, *c*, in figs. 855 and 856.

Fig. 860 is a section of the top of the columns, on which the beam, *c*, is placed.

Fig. 861 is a section of the base of the same columns.

Fig. 862, to a scale of one fourth of an inch to a foot, shows one of the piers to the parapet of the terrace, supposed to be of stonework; in which *d* is the line of the solid ground; *e*, the surface of the new ground; *f*, the level of the terrace; *g*, rough stonework; and *h*, worked stone.

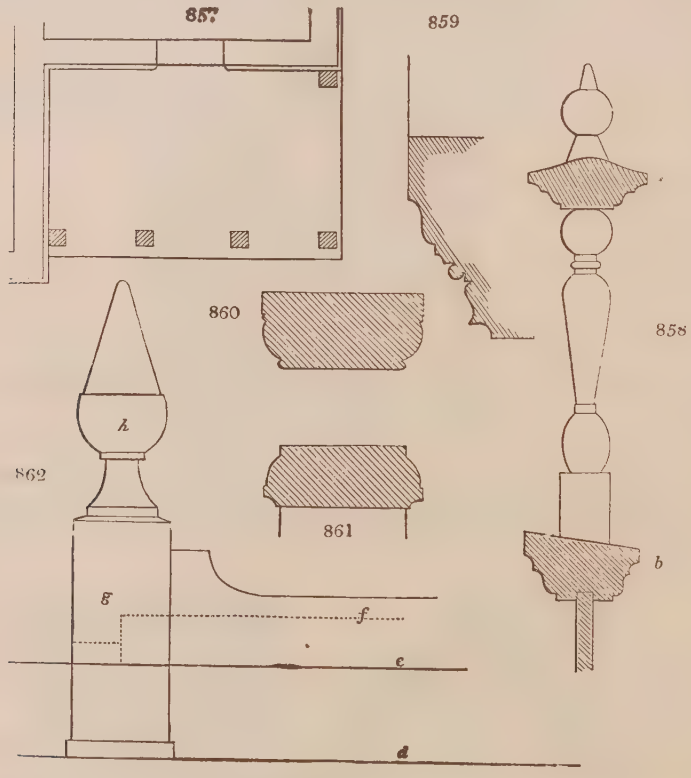


Fig. 863 shows the bottom part of the gable post, seen in fig. 865, and which also serves as a pattern for the pendants from the verge boards. The scale of this figure is two inches to a foot.

Fig. 864 is a section across the eaves of the roof, in which are seen the face of the wall, *i*; the bed moulding, *k*; the soffit, *l*; the situation of the bracket, *m*; the eaves moulding, *n*; the rafter, *o*; and the eaves board, *p*. The scale of this figure is two inches to a foot.

Fig. 865 is a view of part of the barge board, and the gable post; in which are shown the sunk panel, *q*, of the pinnacle; the gable post, *r*; the pierced openings in the verge board, *s s*; the raised ornaments on the same, *t t*; the cross section of the verge board, *u u*; and the cement verge of the tiling, *v v*. The scale of this figure is two inches to a foot.

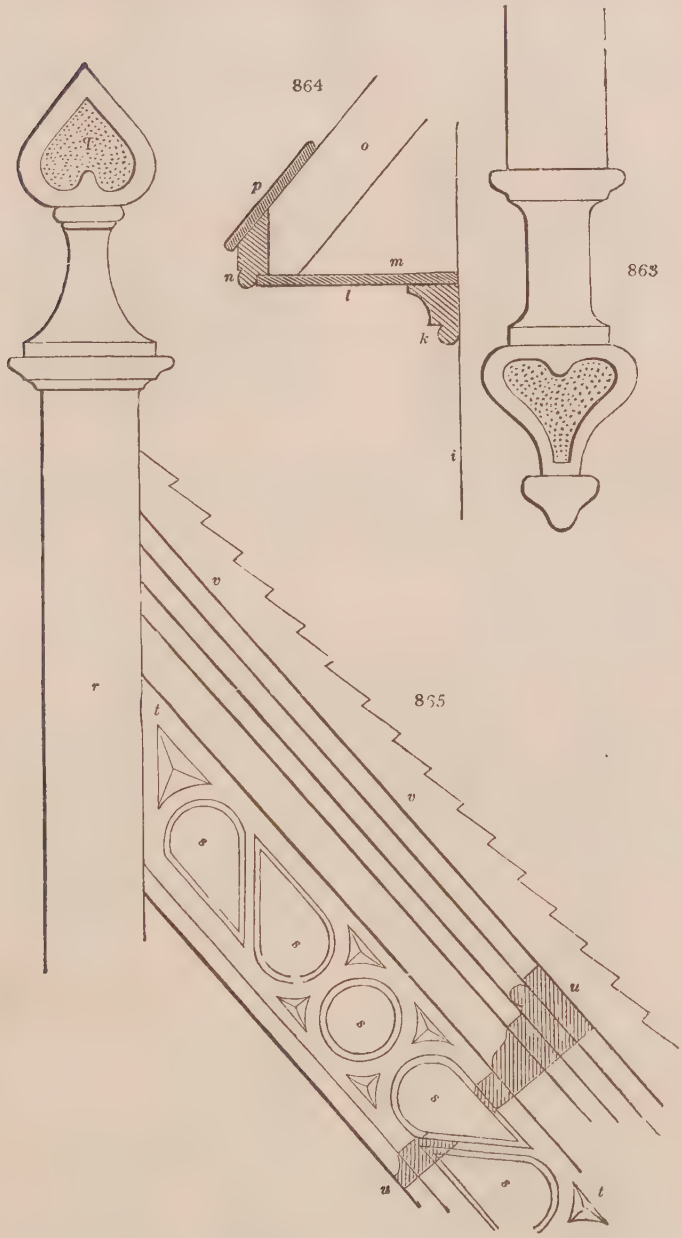
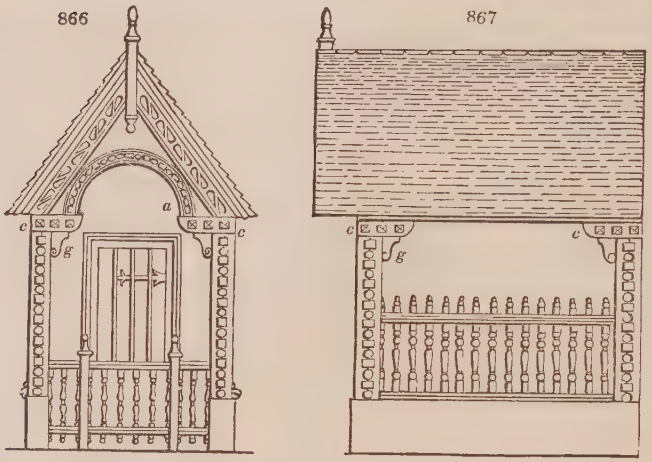


Fig. 866 is the front view of the entrance porch, and

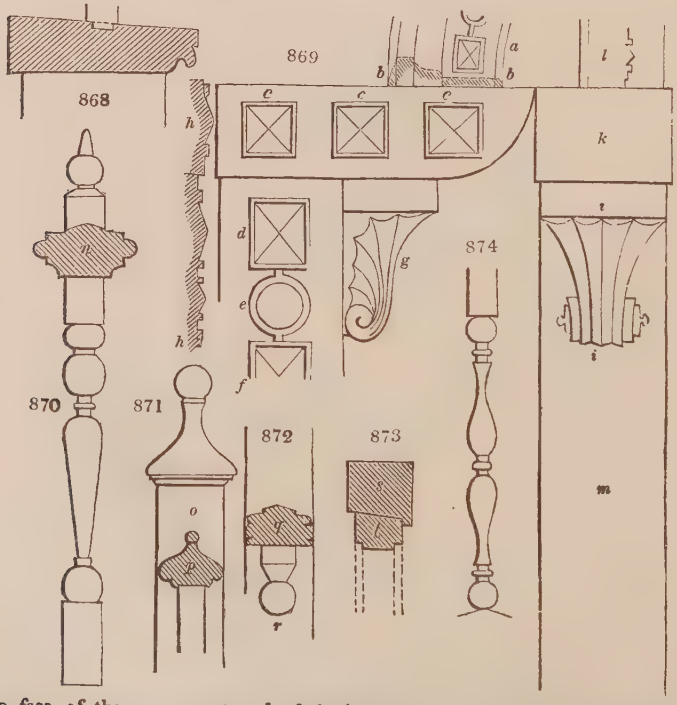
Fig. 867 is the side view of the same porch; both are drawn to a scale of six feet to an inch.

Fig. 868 is a cross section of the oak coping of the wall of the porch.

Fig. 869 is a view and sections of the bracket part of the post, and part of the arch, in the gable of the porch. In this figure, *a* is the commencement of the arch, which



corresponds with the same letter in fig. 866; *b b* show the section of the moulded face of the arch; *c c c* are the three ornaments shown at *c* in figs. 866 and 867; *d*, *e*, *f* are the ornaments shown as decorating the outer sides of the corner posts in figs. 866 and 867; and *g* is the side view of the brackets shown at *g* in the same figures; *h* is a section



of the face of the corner post, and of the impost over it; *i i*, the front view of the bracket; *k*, a front view of the impost over the bracket; *l*, the soffit of the arch; and *m*, the inside view of the corner post, shown without ornament.

Fig. 870 is a baluster in the side of the entrance-porch, in which *n* is a section of the top rail.

Fig. 871 shows the gate-post, *o*, and a cross section of the top rail of the gate, *p*.
Fig. 872, bottom rail of the gate, *q*; and lower part of a baluster, under the rail, *r*.
Fig. 873 shows a horizontal section of the gate-posts, *s*, and of the gate-head, *t*.
Fig. 874 is a baluster of the gate, different from that in the side rail, shown in fig. 870.
Fig. 875 is the elevation of the external door of the house, to a scale of four feet to an inch; below which are the plan, *a*, to the same scale; and the section of the muntings, *b*; the latter to the scale of a quarter of an inch to an inch.

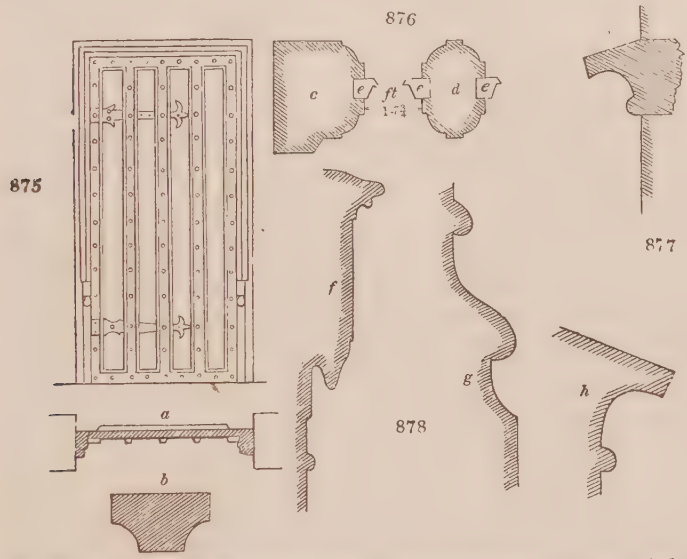


Fig. 876 is a horizontal section of part of a window, showing the stone window jamb, *c*, stone munting, *d*, and the cast-iron frames of the windows let into them, *e e e*.
Fig. 877 is a section of the stone drip mouldings, or labels, put over the windows, to a scale of one inch to a foot.
Fig. 878 shows three sections of different parts of the chimney shafts, to a scale of one inch to a foot; *f* is a section of the head of the shafts; *g* is a section of the base; and *h* is a section of the drip moulding under the base, shown at *h* in figs. 879 to 882.
Figs. 879 to 882 are the elevations of the four different patterns of chimney shafts, below which are the plans, *i i i i*.

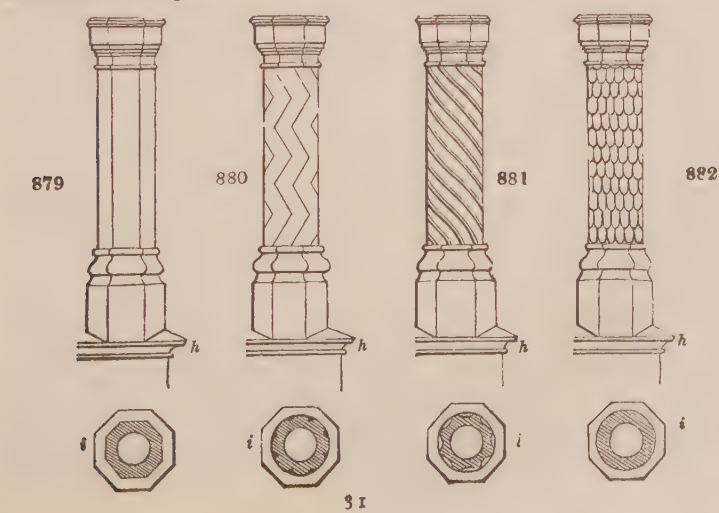
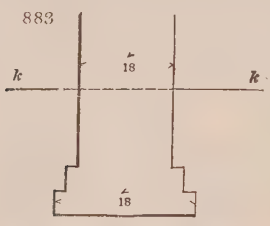


Fig. 883 is a section showing the footings of the walls, and their depth under the original surface line, *k k*, of the ground on which they are built.



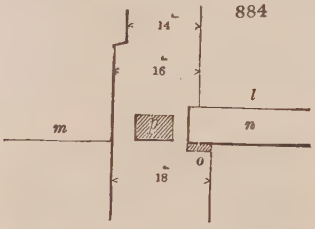


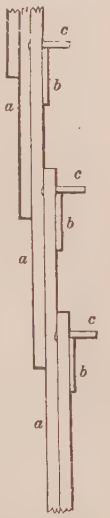
Fig. 884 is a section showing the relative height of the ground floor, *l*, and the surface of the terrace, *m*. In this figure are also shown the joists of the ground floor, *n*; the wall plate on which they are placed, *o*; and the chain plate, *p*, which is continued round the whole building.

Particulars of the several Works to be done in building a Bailiff's Cottage at Bury Hill, near Dorking, Surrey, for Charles Barclay, Esq., according to the Plans, Elevations, Sections, and Details, severally signed by the Parties undertaking the same.

849. *Excavator's, Bricklayer's, and Well-digger's Work.* To dig out the earth for the basement story, and the several trenches for the foundations of the whole of the building, of the respective depths and widths required, and to fill in and well ram round the work. Surplus earth arising therefrom to be spread round the building, to form a terrace, as shown in the plan. To dig a well in the dairy scullery, 4 feet clear in diameter, 45 feet deep; to steen the same in 4-inch brickwork, and to dome it over in 9-inch brickwork. The soil and rubbish which may be made during the carrying on of the works to be taken out of the building, from time to time, as occasion may require. All the bricks to be used in the building, or brought upon the premises, to be sound and good well-burned stocks. The mortar to be composed of the best well-burned grey lime, and clean sharp sand, well tempered together. The footings and foundations to be built of sandstone, and below the ground line to be grouted with hot lime and sand. The remainder of the walls above ground to be built of sandstone laid in neat random courses, with a flat joint garreted on the external face; the stones to be properly headed and prepared, and flushed solid in mortar; the whole of the coins, arches, and inverted arches to be of brickwork, and all the walls to be built of the several heights and thicknesses shown in the drawings, leaving the several apertures therein described. The chimney breasts, jambs, and backs to be of brickwork, with inverted arches under the lowest fireplaces, the flues to be properly gathered and pargeted (this operation is usually performed with loam and cow-dung; but quicklime and pounded brick are found far better, and are now generally used by the best London builders), 12 inches in diameter in the clear. A strong iron chimney bar (see § 602, fig. 542) to be put to each of the fireplaces, and 4-inch brick trimmers to be turned where required. To build stone foundations for the porchways, stone underpinning for the partitions, brick foundations for the sink and to the dairy steps, and an area of 9-inch brickwork to the cellar window, paved with bricks, with sinkhole and drain to deliver the water into the main drain. To pave the cellar and passage adjoining with building bricks laid flat in mortar; and the pantry, store room, and kitchen with dressed paving bricks, bedded and jointed in mortar; and to wheel in such sand as may be required for properly levelling and currenting the same. To put hollow tile drains, 7 inches clear in the bore, where shown by dotted lines in the plan; altogether a length of 200 feet; and to provide and fix 6 cast-iron stink-traps, 8 inches square, one at each of the external apertures thereof; the whole to be laid with a proper fall, and sufficient depth to deliver the water away from the lowest part of the building. To pave the drying-porch with pebbles; to build brick steps, and to bed the oak nosings (the nosing of a step is the front part of the tread, between the line formed by the meeting of the riser with the tread) to the cellar stairs. To build the foundations, the enclosure walls, and an oven 4 feet by 3 feet 9 inches in the clear, properly domed, plastered, and paved; and to find and fix the requisite iron-work and door for the same complete. To build brick benches, with 4-inch arches and piers, in the dairy, to receive a slate covering. To fill in the nogging partitions with brick nogging flat. The bricklayer to find scaffolding and ladders, and to fix and refix the same as occasion may require, as well for his own work as for the other trades requiring the use of them; and to allow the same to remain till the external part of the house and chimney shafts shall be completed. The walls to be carried up in an upright,

substantial, and workmanlike manner; and in the progress of the building no part of the work to be raised more than 4 feet above the other, except in the pediments, but the whole to be carried up in a regular and equal manner. To fix the wooden bricks, and to bed all the plates, bond timber, and lintels in loam. To cut all the rakes and splays, and all the chasings required for the lead flashings; to make good and stop the same with Roman cement; to bed and point the door frames in lime and hair, and to underpin the sills. To cover the whole of the roofing with old sound plain tiles (old are preferred for their picturesque effect) laid on straw to a 7½-inch gauge, with heart of oak laths, the hips, ridges, and eaves in mortar: the straw to be of equal thickness throughout, and in sufficient quantity to exclude the light: no crooked, cracked, or cornerless tiles to be used; and the whole of the tiling to be done with particular care, so as perfectly to exclude the snow, rain, and wind. (The gauge of plain tiling is reckoned from the distance which the first and third laths are apart, measuring from centre to centre. For a 7½-inch gauge, the workman nails on a lath, and, with a measure or gauge 7 inches and a half long, finds the place of the third lath; and, having fixed that, nails another lath between. This arrangement, when the tiles are hung on, causes them to overlap, so as to show uncovered 3 inches and a quarter of each course. By this means the third tile overlaps the first 2 inches and a half, which makes the work impervious to rain. This will be rendered clear by the section fig. 885; in which *a a* are the tiles; *b b*, the laths; and *c c*, the wooden pegs, by which the tiles are hung on the laths.) The fillets, listings, and verges to be of Roman cement. (The fillets are narrow strips of lime and hair, or cement, put to cover the horizontal joints, where tiling abuts against walls; the listings are the same upon an inclined plane. The verges are the external edge of the tiling in gables, which are covered with lime and hair, or Roman cement.) The bricklayer to find all the materials, ropes, boards, tackle, tools, workmanship, and ironwork, for the completion of his work, and the carriage thereof; to do the whole in the best and most workmanlike manner; and to colour twice over in good stone colour, to match the stone part of the chimney shafts, the whole of the brick coins and brick part of the chimney shafts. To do all the beam-filling, and wind-pinning required. The whole to be done subject to the provisions of the general particular at the end.

885



850. *Plasterer's Work.* To lath, lay, set, and colour stone colour, the gable of drying-porch. To lath, lay, set, and white the ceilings of basement story and scalding-room, and to lime-white the walls twice over. — Ground Floor and Chamber Story. To lath, lay, set, and white the whole of the ceilings, except the parlour, which is to be lath, lay, float, set, and whited. To lath, lay, and set the whole of the battenings and strings of the stairs; and to render set the walls and nogging partitions, so as to fit them for colouring, and in the parlour for papering. All the timbers of the partitions to be diagonal-lathed. The plasterer to find all materials, tools, tressels, boards, moulds, rules, carriage, and workmanship required for the completion of his work; and to do the same in the best and most workmanlike manner, subject to the provisions in the general particular at the end hereof. [The same person contracts for both the bricklayer's and the plasterer's work, and signs this particular in the following form: —]

I, the undersigned, hereby undertake to perform the foregoing bricklayer's and plasterer's work for the sum of four hundred and eighty-five pounds five shillings and eleven pence. S. B.

851. *Mason's Work.* To pave with Yorkshire stone paving, properly squared in courses, the porchway, the dairy, and the scalding-room; the dairy floor to be rubbed; with proper holes for stink-traps where required; with Yorkshire steps and risers where shown in the plan, and with a solid Yorkshire step at the entrance door of the house. To put Yorkshire curb stones to the drying-porch and area, 5 inches by 4 inches, properly cramped, and run with lead. To put plain Portland stone shelves, mantels, jambs, slips, and bases to the chambers; and the same, with profiles, and reeded shelf and turned pateras (the representation of a cup in bas relief, a common ornament in friezes), in parlours, with Yorkshire stone hearths, and Portland stone slabs to each. The kitchen to have inch-and-three-quarters Portland stone mantel jambs and shelf. To put a Yorkshire stone sink in the scalding-room, 5 feet long, and 2 feet 3 inches wide, with proper hole for washer. To put moulded window frames, labels, and chimney shafts of Bath stone, properly cramped and run with lead, according to the drawings, and properly to fix, and run with lead, the iron frames, lights, and stanchion bars. To put milled slate benches in the dairy, an inch and a quarter thick, with rounded edges, and milled slate skirting

7 inches high, backed up, and set in Roman cement, in the kitchen, dairy, pantry, and store room. The mason to find all materials, carriage, and workmanship required for the completion of his work in the best and most workmanlike manner; and to fix the whole complete, subject to the conditions in the general particular at the end hereof.

[The mason contracting for this, affixes his signature to the same form as before.]

The terrace shown in the drawings (see the figures in p. 419 and p. 420) is not described in this particular, nor included in the estimate; as the expense depends upon whether the free sandstone, of which it should be built, can be obtained with facility or not.

852. *Carpenter's and Joiner's Work.* The whole of the materials to be provided and sawed out square free from wane, of the several scantlings and thicknesses herein specified; to be carted to the spot by the contractor, and to consist of the best yellow Dantzic or Memel fir, or English oak, free from sap, shakes, or large and loose knots. The whole of the carpentry is to be framed in a workmanlike manner, according to the drawings; the carpenter finding labour, nails, and tools, and all kinds of ironwork required for the purpose; the whole to be done subject to the provisions of the general particular at the end hereof. The bond is to pass through the openings, and not to be cut out till the work has settled. To put a chain plate of oak, 6 inches by 4 inches and a half, round the whole of the building, and the middle wall in the centre of the same, at the height shown in the plan; the whole to be properly halved, and bolted at the laps, and dovetailed at the angles. To put three tiers of bond in the ground floor story, and three tiers in the chamber story, of oak, 3 inches by 2 inches and a half; and an oak wall plate under each floor, 4 inches and a half by 3 inches, dovetailed at the angles, and halved and spiked at the laps. To put double oak lintels, 4 inches thick, to all the openings, of the width of the respective walls or reveals, to lie 9 inches on the wall at each end. Oak wooden bricks to be provided in the jambs, for fixing the several linings where required, not exceeding 2 feet apart. — Parlour. To put oak joists, 6 inches by 3 inches, 12 inches apart; the trimmers and trimming joists to be 6 inches by 4 inches. — Chamber Floor. To put fir joists throughout, 9 inches by 2 inches and a half, 12 inches apart. The trimmers and trimming joists to be 9 inches by 3 inches and a half, with one row of 1 inch and a quarter, fir keys (or strutting pieces) in each of the large chambers. — Ceiling Floor throughout. The ceiling joists to be 4 inches and a half by 2 inches, 12 inches apart, with binding joists, 5 inches by 3 inches and a half, and angle beams fixed with iron screw pins to the tie beams, 5 inches by 3 inches and a half, trimmed to the chimneys, and for a trapdoor over the landing to the stairs. — Roofing. Gutter plate, 8 inches by 4 inches. Tie beams, each in one length, joggled to the plates, 7 inches by 4 inches; king posts, 9 inches by 3 inches, with three quarters of an inch iron screw pins 2 feet long, with nuts 3 inches long, mortised through the king posts. Struts, 4 inches by 3 inches; framed principal rafters, 6 inches by 3 inches at bottom, and 4 inches by 3 inches at top; purlins notched on the back of the principal rafters, 5 inches by 3 inches; oak wall plate, 5 inches by 3 inches; pole plate, 4 inches and a half by 2 inches and a half; 1 inch and a half sleepers, 5 inches wide, laid on the back of the rafters to form valleys, 1 inch and a half ridges and hips, 6 inches wide; common rafters, 4 inches by 3 inches, 13 inches apart; inch yellow deal gutter board and bearers, with feather-edged flanch board; and the same to the chimneys. The middle gutter is to be 12 inches wide at the narrowest end, and to rise 2 inches in every 10 feet, with one 2-inch splayed drop; proper valley boards are to be put for the lead valleys. The roof of the scalding-room, and of the porches and oven, are to have plates, rafters, ridges, valleys, and gutters, as before described, and the whole of the eaves are to have feather-edged oak eaves board, 4 inches and a half wide, and 1 inch and a quarter, and three quarters of an inch thick, with inch brackets to receive the eaves moulding and soffit. — Partitions for Nogging Flat throughout. To put heads and sills, 4 inches and a quarter by 3 inches; and common quarters, 4 inches and a quarter by 2 inches and a half, 18 inches apart; door posts, principal quarters, and braces, 4 inches and a quarter by 3 inches; and nogging pieces, 4 inches and a quarter by 2 inches. All the heads of partitions to be dovetailed into the plates. All the external walls are to be battened inside with inch oak, 2 inches and a half wide and 12 inches apart. To make a proper barrel curb, for the well-diggers, and such centering as may be wanted for the archers and trimmers.

853. *Joiner's Work.* To be done according to the several drawings of details. All the stuff to be of the best well-seasoned (kept till so dry as to be in no danger of shrinking when used) yellow deal, listed, free from sap and shakes, and the whole to be neatly wrought and finished off in a workmanlike manner. — Floors. To lay inch straight joint floors, with proper borders to slabs in the parlour, passage, and bed-rooms. — Doors. To put inch and three quarters four-panel both sides square doors to all the rooms and closets, and to the head of the cellar stairs, hung with 3 inches and a half butt hinges, and 6 inches iron rim brass knob locks, with 1 inch and a half single-rebated

jambs, having framed grounds beaded on edge, with quirk ogee fillet and square, to form architraves. To put an inch wrought ledged and beaded trapdoor to go into the roof, with inch rebated linings. The external doors into the entrance-porch, and the drying-porch, to be of oak, with doorcase, hinges, and linings, &c., according to the drawing; and to have a 10-inch iron-rim drawback lock, and two 8-inch bright rod bolts to each. The cellar door to be inch proper ledged, with oak proper doorcase, 5 inches by 3 inches and a half, with lock and key, and hung with 18-inches cross garnet hinges. — Windows. To prepare a wood model, and provide cast-iron lights, casements, frames, hinges, fastenings, and stay bars to the several openings, according to the drawings. To provide stanchion bars four to each light, of an inch square wrought iron, in the dairy, the pantry, and the store room. The dairy, the pantry, and the store room to have fly wire (wirecloth to exclude flies) inside of the windows, and the casements to open from the outside, with two panels of fly wire in the door between the pantry and the passage. The several windows to have inch window boards with rounded edge, and also three quarters of an inch splayed jamb linings, and soffits with framed grounds, and moulding for architraves, to match the other doors, except those in the cellar, store room, pantry, dairy, and scalding-room. The kitchen and parlours to have 1 inch and a quarter square framed folding inside shutters, with back flaps, proper hinges, and iron bar fastenings. — Skirtings. To put inch torus skirting 7 inches high in the parlour, and three quarters of an inch square skirting throughout the chamber floor. All the skirtings to have narrow beveled grounds and backings. — Staircase. To put inch steps, risers, and carriage, housed into the string boards, and 1 inch and a half close string, with moulded planceer and raking skirting. Moulded handrail, and inch square bar balusters, with iron balusters, and turned newels. The spandril to be filled in with inch and quarter both sides square framing; and to put proper apron lining (the lining which cases the trimmer) and nosing to the landing. To put oak framed nosings to the brick steps of the cellar stairs, with oak wrought and rounded handrail and newel posts. To put inch and half oak pump cheeks and sills, and to case the same with inch deal, and proper cap, &c., and to fix the same in the scalding-room. To put proper staff beads to the angles of the chimney breasts. To prepare and fix with iron holdfasts, 150 feet run of inch and quarter shelf, 12 inches wide, and brackets in the pantry, store room, or elsewhere, as may be directed. To put 2 inches and a half oak carved verge boards with crown mouldings, and carved pendants, with three quarters of an inch wrought oak soffits to all the pediments, and eaves moulding, and three quarters of an inch soffit and bed mould, also of oak, to all the eaves. The entrance porch and drying porch also to be fitted up with oak, the whole according to the drawing of details. The carpenter and joiner to find all the materials, tools, labour, nails, glue, and every description of ironmongery, locks, bolts, bars, hinges, and fastenings, and the carriage and fixing thereof, and every thing required for the completion of his work in the best and most workmanlike manner; and to prepare and fix all manner of beads, stops, fillets, grounds, linings, and backings required for the perfect execution of the work, whether the same may or may not be minutely specified in this particular. The whole to be done, subject to the provisions in the general particular at the end hereof.

[Signed, as before, by the person undertaking the carpenter's and joiner's work.]

R. S.

854. *Plumber, Painter, and Glazier's Work.* Plumber. To put flashings of milled lead, 8 inches wide, 5 lbs. to the foot superficial, chased into the stonework, and fixed with wall hooks to each of the chimney shafts; and to put gutters, 18 inches wide, of 7 lbs. cast lead, and aprons to such as require it. To cover the middle gutter, and gutter at the drying-porch, with cast lead, 7 lbs. to the foot superficial, to turn up 8 inches under the tiles on each side, and to put 3 inches lead rain-water stack pipes, with cistern heads to bring the water to the ground in the angle of the north front, and at the drying porch. To cover the valleys with 7 lbs. cast lead, 15 inches wide. To put proper flashings of milled lead, 5 lbs. to the foot superficial, 12 inches wide, chased into the stonework where the roofs of the scalding-room and of the porchway abut against the same. To put a 5-inch brass grate, and bell trap, and 2 inches and a half lead pipe to the sink. To put a good stout 4-inch lead pump barrel, weighing 2 qrs. 14 lbs., in the scalding-room, with 50 feet of 2 inches and a half lead suction pipe, with bucket, sucker, and iron handle complete. — Glazier's Work. To glaze and back putty all the lights and casements, with good second Newcastle crown glass. — Painter's Work. The whole of the iron frames, lights, and casements, and fly wire to be painted inside and out, four times, in good oil colour. The whole of the internal joiner's work to be knotted, primed, and painted three times in oil stone colour. The oakwork is not to be painted.— The plumber, painter, and glazier to find all materials and workmanship; and the carriage thereof, and every thing requisite for the performance of his work; and to do the

same in a perfect and workmanlike manner, subject to the general particular at the end hereof.

[Signed, as before, by the plumber, painter, and glazier.] W. B.

855. *General Particular.* The bricklayer's work to be completed by the day of . The naked floors and roofing to be fixed and finished by the day of . The whole to be covered in by the day of . The plastering to be begun as soon as the roofing is covered in, and finished, as well as the mason's work, by the day of . The whole of the joiner's work to be finished by the day of ; and the painter's by the day of The glazing to be done as soon as the lights and casements are fitted in. Each contractor shall be answerable for all damage done to his respective work during the progress, either by the inclemency of the weather or otherwise; and shall make all good, and leave the same perfect at the final completion of the work. The work to be paid for within one month after the certification of the completion of the contracts. — The whole of the materials are to be found by the contractors, and are to be of the best of their several kinds, and fit for the purpose. The work is to be done in a substantial and workmanlike manner, under the direction and to the satisfaction of the Architect appointed for the purpose by the employer; and every thing is to be performed that is necessary for completing the whole work in the usual and customary manner, notwithstanding the same may not be mentioned in the specification. And, if any alteration shall be made by the direction of the employer, during the progress of the work, it shall not vitiate or annul the contract, but the value of such alteration shall be ascertained, at the customary prices of the neighbourhood, by the Architect, whose decision between the parties shall be final. The full amount of the contracts to be paid when the several works are certified by the surveyor to be complete and finished. And, if any material shall be brought upon the premises which is disapproved by the surveyor, or any workman employed whose skill is considered insufficient by him, the said materials or workman to be removed or discharged immediately, upon the contractor receiving notice from the surveyor so to do, either in writing or verbally. And further, if any or all of the said works should be performed in any way inferior to the description or intention of the particular and drawings, or shall be deteriorated below a fair standard of good quality or sound workmanship, the same shall also be valued by the said Architect as aforesaid, and deducted from the amount of the contract by the employer; and his decision in this case shall also be final. The several contractors to be responsible to make good all latent defects arising from bad work or bad materials, notwithstanding the certification as aforesaid. The contractor or contractors are to sign an agreement, when required so to do, to perform the work according to the foregoing particulars and conditions; which agreement shall contain such additional clauses as the solicitor to the employer shall deem requisite to secure and enforce the fulfilment of the same.

[This general particular is signed by all the different contracting tradesmen who have signed the separate particulars, in the manner before shown.]

S. B., Bricklayer, Plasterer, &c.
W. G., Mason.
R. S., Carpenter and Joiner.
W. B., Plumber, Painter, and Glazier.

856. *Measurement and Estimate.* Account of the quantities of the several works required in building a bailiff's cottage, with an estimate of the expense of performing the same.

857. *Bricklayer, Excavator, and Well-digger,* A. M. (that is, finding All Materials).

102 cubic yards digging, filling, and ramming .....
6 rods 265 feet reduced stonework below ground, grouted .....
13 rods 7 feet reduced above ground with brick coins and garreted on face .....
4 rods 183 feet reduced brickwork in shafts and chimneys .....
25 squares 83 feet superficial, old plain tiles, with heart of oak laths laid in straw; with the hips, ridges, and eaves in mortar .....
65 yards brick nogging flat.....
27 yards stock paving flat, in mortar.....
34 yards dressed paving bricks, bedded and jointed in mortar .....
8 and a half yards pebble paving .....
92 feet run (lineal) splay .....
60 feet chase-cut and cement stopping.....

78 feet verge (see fig. 865 *v*, p. 423), in cement .....
58 feet hip .....
100 feet ridge .....
200 feet run hollow tile drain 7 inches bore, and digging and setting and filling in .....
1 sinkhole .....
6 cast-iron sink-traps .....
2 door frames bedded and pointed, colouring brick shaft, and back at scaling-room, and square bases of the chimneys of the house, and all the coins .....
30 feet deep of well-digging, and labour to steening .....
15 feet do. of do. (Extra depth).....
6 strong iron chimney bars.....
Ironwork to oven .....

£444 : 1 . 4

858. *Plasterer's Work*, A. M.

94 yards lime-whiting.....
204 yards whitewashing to new work .....
7 yards stone colour .....
245 yards render set .....
261 yards lath, lay and set .....
19 yards floated do. .....

£41 : 4 : 7

859. *Mason's Work*, A. M.

190 feet superficial York paving squared in courses.....
182 feet do. rubbed.....
18 feet 9 inches Yorkshire stone hearth .....
23 feet 9 inches Portland stone slab .....
12 feet 9 inches inch-and-three-quarters Portland stone mantles, jambs, and shelf .....
47 feet 5 inches seven eighths of an inch thick in chambers .....
63 feet 6 inches milled slate benches to the dairy .....
87 feet 7 inches milled slate skirting set in cement .....
11 feet 3 inches superficial Yorkshire stone sink.....
28 feet 6 inches run Yorkshire curb 5 inches by 4 inches, cramps, and lead .....
feet 6 inches Yorkshire stone step .....
24 feet rounded edges to slate shelves .....
4 feet 6 inches reeded edge .....
2 holes for stink-traps 8 inches square .....
2 turned pateras .....
2 bases to do. .....
4 three-light Bath stone window frames, and labels, as per drawings, figs. 876 and 877, p. 425.....
10 two-light do. (with iron frames and stanchion bars in ditto, and 3 light frames fixed only) .....
3 plain Bath stone chimney shafts and bases.....
4 enriched do. do. .....
Yorkshire stone landing, and corbel, to secure the stack of chimneys. (A corbel is a projecting row of stones, or of pieces of timber, to support a superincumbent part of a wall; it is here used to support the upper division of the shaft which overhangs its base).....

£234 : 12 : 1

860. *Carpenter's and Joiner's Work*, A. M.

154 feet cubic of oak in bond, plates, &c. .....
422 feet 9 inches foreign fir, framed, in roof, floors, and partitions...
11 square (a square is 100 superficial feet) 11 feet superficial, in oak battening 2 inches and a half wide, and 12 inches apart.....
180 feet superficial feather-edge flanch and valley board .....
58 feet 6 inches yellow deal gutter and bearer .....
36 feet 9 inches inch-and-quarter keys in floor .....
40 feet inch-and-half sleepers for valleys.....

87 feet 2 inches inch-and-half hips and ridges .....
227 feet run oak eaves board .....
11 feet 5 inches cubic oak framed .....
2 feet 4 inches oak wrought and framed .....
2 feet 4 inches do. do. circular .....
11 feet 7 inches do. wrought, framed, and moulded .....
Oak wood bricks.....
9 screw pins (wrought iron) to angle beams, and fixing.....
8 iron screw pins and nuts to king posts .....
1 gate to the porch, of oak with turned balusters, and hinges complete .....

Joiner's Work.

105 feet superficial, three-quarters-inch splayed lining .....
109 feet three-quarters-inch square skirting .....
244 feet three-quarters-inch wrought oak soffit.....
3 feet inch rebated lining... .....
48 feet window board rounded .....
52 feet 6 inches steps, risers, and carriage .....
148 feet 8 inches framed grounds .....
2 feet 3 inches wrought beaded and ledged trapdoor .....
19 feet 6 inches proper ledged door .....
2 feet 3 inches apron lining .....
18 feet 5 inches wrought pump case .....
28 feet 3 inches torus skirting .....
15 feet raking do. .....
9¼ squares of inch straight joint floor .....
97 feet 6 inches superficial inch-and-quarter closet front and door ...
42 feet square framed folding window shutters, including hinges ....
13 feet 4 inches, inch-and-quarter close string .....
21 feet square framed spandril .....
150 feet shelf wrought, rounded, and fixed with brackets and holdfasts .....
167 feet 3 inches, inch-and-half single-rebated jambs .....
9 feet 9 inches oak pump cheeks .....
7 feet 6 inches oak filling in to gable of porch cut circular.....
206 feet 8 inches inch-and-three-quarters both sides square doors....
39 feet 6 inches oak Gothic doors .....
208 feet superficial moulded work to oak verges, and fixing with pierced sinkings .....
74 feet superficial oak columns turned spiral, as shown in figs. 855 and 856, in p. 421 .....
13 feet 6 inches oak wrought, framed, and weathered (beveled to throw off the wet) .....
35 feet 7 inches fly wire .....
435 feet run quirk ovolo and fillet.....
266 feet 6 inches narrow grounds .....
10 feet moulded planceer .....
3 feet nosing .....
120 feet angle staves .....
132 feet bar balusters .....
8 feet wrought and rounded rail .....
15 feet moulded handrail .....
120 feet eaves moulding of oak .....
120 feet bed mould .....
24 feet 6 inches, inch-square wrought-iron bars .....
2 feet 9 inches cubic oak in nosing to steps .....
3 inches do. in newel .....
3 feet 9-inch oak wrought, framed, and weathered.....
9 feet 9-inch posts, wrought, framed, and carved.....
4 feet 10-inch do., coping, wrought, framed, and beveled .....
11 pair 3-inch and a half butt hinges, and fixing them.....
11 6-inch iron-rim brass-knob locks .....
4 closet locks .....
2 10-inch iron-rim locks .....
4 8-inch rod bolts bright.....
2 pair of old formed hinges, as per drawing .....

5 pair 2-inch butts .....
1 pair 18-inch garnets .....
1 cellar lock and key .....
1 wooden pattern for casting the iron lights and casements .....
32 cast-iron frames .....
32 casements with hinges and stay bars .....
2 iron shutter bars .....
4 newel posts turned .....
1 hole for handle .....
1 cap to pump case .....
Barrel curb for well .....
5 gable posts carved and fixed, 7 feet 6 inches long .....
8 pendants 4 feet long .....
4 caps and 4 bases to columns .....
36 turned balusters .....
4 carved caps to the posts in the porch .....

£ 485 : 7 : 11

861. *Plumber's, Painter's, and Glazier's Work*, A. M.

12 cwt. 2 qrs. cast lead .....
3 cwt. 2 qrs. milled lead .....
53 feet run 2½-inches lead pipe and joints .....
26 feet 3-inch lead rain-water pipe .....
2 cistern heads .....
1 5-inch brass grate and bell trap .....
1 stout 4-inch lead pump barrel complete, with iron handle, bucket, sucker, and fixing .....
152 feet second Newcastle crown glass, small panes .....
154 yards of painting thrice in oil, of stone colour .....
146 feet run bar do. .....
218 feet square skirting, 6 inches high .....
48 feet 6 inches torus skirting, 7 inches high .....
26 feet handrail .....
132 feet bar balusters .....
90 feet angle staff .....
32 casements and frames both sides, 12 small squares in each .....
2 shutter bars .....

£ 68 : 18 : 10

862. *Summary of Estimates for the Bailiff's Cottage*, A. M.

Bricklayer	444	1	4
Plasterer	41	4	7
Mason	234	12	1
Carpenter and Joiner	485	7	11
Plumber, Painter, and Glazier	68	18	10
	£ 1274	4	9

863. *General Estimate.* This cottage contains 22.842 cubic feet; which, at the above sum, amounts to 1*s.* 1¼*d.* per foot, which thus appears to be the proper sum, per cubic foot, for estimating dwellings of this description in the neighbourhood of London.

864. *Remarks.* Our readers, we think, will agree with us in highly approving of this cottage, both for its internal accommodations and arrangements, and for its external effect. The parlour and kitchen are of good sizes, and are both well lighted; and the cellarage, pantry, store room, and dairy are ample. The latter is large, because it is supposed to furnish supplies to the family residing in the mansion. It is very properly placed on the north side of the building, and both doors and windows are protected by wirecloth from the entrance of flies. The pump being in the dairy scullery is a great convenience. The drying-porch, judiciously placed on the south side of the building, is a most useful part of this house, and we could wish it appended to every dwelling in the country; not only on account of the accommodation which it affords for drying things in wet weather, and for sitting or working under, but for its ornamental effect. It is a more social appendage than the veranda, because it allows of a party sitting round a table, either to work or to eat. In America such a porch would be a delightful place for husking Indian corn, as described by Cobbett; or, in Savoy, for taking the skins off walnuts, to prepare them for being crushed for oil, as described in the interesting *Travels*

in the Tarentaise, by the eminent geologist Bakewell. All the chimneys are in the interior wall, which brings the shafts exteriorly to the highest part of the general mass, and completes what Hogarth, in his *Analysis of Beauty*, calls the painter's pyramid. It is always more satisfactory to see chimneys issuing from the highest part of the roof, than from the side walls, or from any lower part; because the rising sides of the roof seem to conspire in supporting what issues out of its apex, as the leaves of a plant seem to support the flower stem which proceeds from its centre, or the spreading lower branches of a fir tree do its spiry top. When it is known, also, how much this disposition of the chimneys contributes to their drawing well, and to the general warmth of the house, its satisfactory effect cannot but be greatly heightened in every well regulated mind.

Design II. — *A Farmery in the Old English Style, chiefly calculated for Dairy Husbandry, and conducted by a Bailiff, for the Proprietor of the Land.*

865. *Situation.* This farmery, of which fig. 886 is the isometrical elevation, and fig. 887, the ground plan, is built a few yards to the north of the bailiff's house, which

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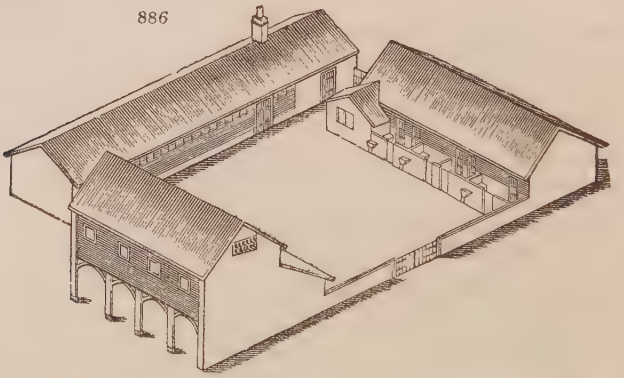
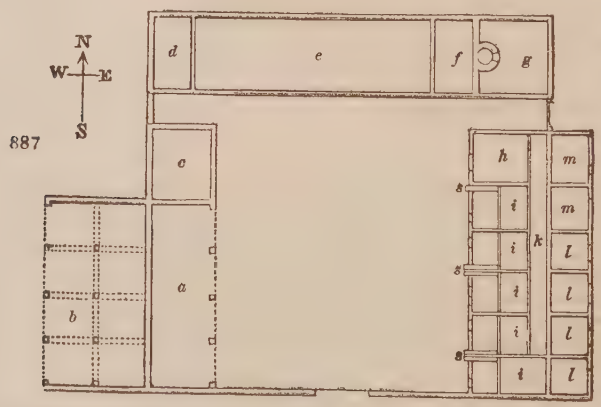


forms the subject of the preceding Design. Both, as before observed, were erected in 1831, at Bury Hill, near Dorking, for Charles Barclay, Esq., from the Design, and under the superintendence, of John Perry, Esq., Architect, of Godalming.

887



866. *Accommodation.* The ground plan, fig. 887, to a scale of forty feet to an inch, shows a cattle-shed, *a*; waggon and implement house, with granary over, *b*; hay-store, *c*; calf-pen, *d*; cow-house, *e*; another calf-pen, *f*; slaughter-house, *g*; swill-cisterns and tanks for holding liquid food, and bins for dry food, for pigs, *h*; piggeries, *i i i i i*; passage between the piggeries and the fowl-houses, *k*; fowl-houses, *l l l l*; and two places for fuel, *m m*. There is a pigeon-house over the granary, as may be seen in the elevation, fig. 888. These buildings are placed on three sides of a cattle-yard, which is open to

the south, and overlooked in that direction by the windows of the bailiff's house. There is no stable in this farmery, all the field labour being performed by four pair of oxen, which stand in the cattle-shed. The surface water may be supposed to be conveyed from the passage round the farm-yard by a gutter, forming a line of demarcation between that passage and the space for the dunghill in the centre, and having traps communicating with an underground drain. The water from the roofs may be collected by gutters at the eaves, and conveyed to the same underground drain as that which carries off the surface water. All the liquid matter of the cow-house, cattle-sheds, and pigsties should be collected by gratings into covered gutters, and by them conveyed to two liquid manure tanks in the centre of the yard, over which should be placed the dunghill; and, if the greatest economy of manure, and also a pattern to surrounding farmers, were, as we think they ought to be, leading objects, this dunghill ought to be covered with a roof.

867. *Construction.* The walls are built of local sandstone, with the exception of the south wall of the cow-house, and of the west wall of the granary; both of which are of studwork, weather-boarded. The roof, over the cattle-shed and hay-store is to be covered with pantiles, and all the other roofs with hoop chips. Hoop chips are the shavings made by the coppice cutters, when splitting and preparing large hoops from long hazel and other rods grown in coppice woods: they are generally upwards of an inch broad, a quarter of an inch or more thick, and from 18 inches to 3 feet in length. They are laid on, and sewed to the laths, like thatch; and, after a few years, are hardly to be known from a roof of that description. Their durability, when the roof is so steep as to throw off the water effectually, is equal to that of tiles, and they require less repair. Fig. 888 is the south elevation, in which may be seen the manner in which the oak gate-

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posts are kept firm in their places, by the underground braces, to the subsills, *n n*. Fig. 889 is the back elevation of the cow-house, in which are seen, to the right, the

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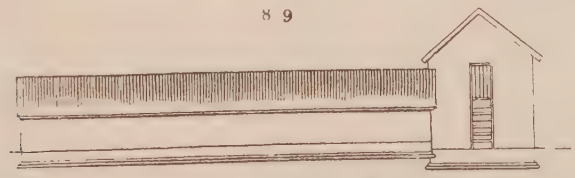

gable end of the granary, and its outside step-ladder. Fig. 890 is the front elevation of the cow-house and the slaughter-house; showing the manner in which the former is ventilated by luffer-boarding under the eaves. Fig. 891 is an elevation of the waggon-house, with the granary over, in which is seen a side view of the outside wooden stair or step-ladder; and, under the ground line, the inverted arches, on the abutments of which the stone bases of the story posts are placed. These stone bases are shown in fig. 892,

890

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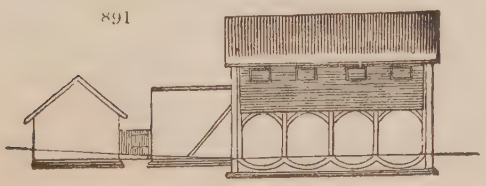

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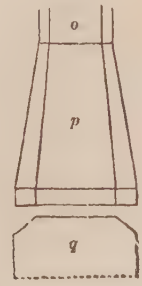

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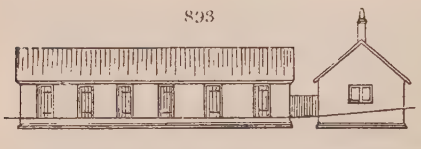

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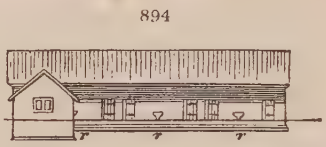
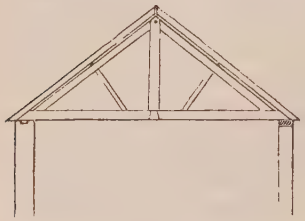


on a scale of half an inch to a foot. In this figure, *o* is the post; *p*, the stone base; and *q*, half of the plan of the same. Fig. 893 shows the elevation of the front of the fowl-houses, and the end of the slaughter-house; and fig. 894 the front of the pigsties. In the last figure are seen, at *r r*, the ends of the cast-iron troughs, which project about a foot from the

895



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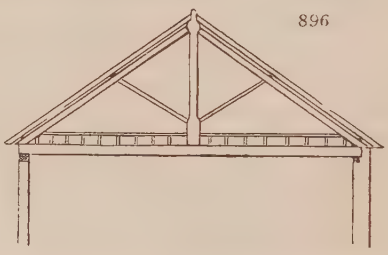

wall, for receiving the pigs' food. They are seen in the ground plan, fig. 887, at *s s s*. All these elevations are to a scale of forty feet to an inch. Fig. 895 shows the construction of the roof of the cow-house, and fig. 896 that of the roof of the granary; both to a scale of twelve feet to an inch. Fig. 897 shows a section, on a scale of twelve feet to an inch, through the piggeries and fowl-houses, in which *t* is the fowl-house; *u*, the passage between the fowl-houses and the piggeries; *v*, the pigsties; and *w*, the open yards in front of them. Other details of construction may be gathered from the following particulars of the work to be done: —

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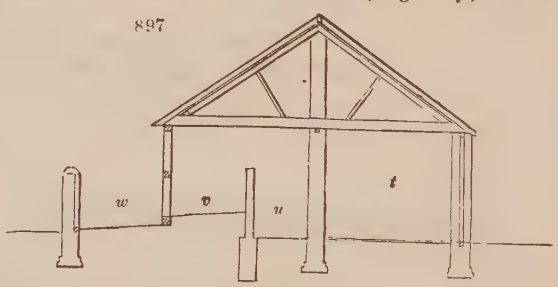

Particulars of the several Works to be done in erecting certain Farm Buildings at Bury Hill, near Dorking, Surrey, for Charles Barclay, Esq., according to the Plans, Elevations, Sections, and Details severally signed by the Parties undertaking the same.

868. *Bricklayer, Excavator, and Well-digger.* To dig out the several trenches for the foundations, of the respective depths and widths required, and fill in and well ram round the work. To level and form the ground for the farm-yard and paving, and to spread the surplus earth, if any, wherever required so to do, any where within 50 yards of the farm-yard: if an additional quantity be considered necessary, it is to be carted to the spot by the employer. To dig a well, 4 feet clear in diameter, 45 feet deep; to steen the same in 4-inch brickwork, and to dome it over in 9-inch brickwork. All the bricks to be used in the work, or brought upon the premises, to be sound and good well burnt stocks. The mortar to be composed of the best well burnt grey lime, and clean sharp sand, well tempered together. The foundations of the walls to be built of sandstone below the ground line, and to be grouted with hot lime and sand. The remainder of the walls above ground to be built of sandstone, laid in neat random courses, with a flat joint garreted on the external face; the stones to be properly headed and prepared, and flushed solid in mortar; the whole of the coins, and arches, and inverted arches, to be of brickwork. The whole to be built of the several heights and thicknesses shown in the drawing; leaving the several apertures therein described. The chimney breast, back, and shaft, for the copper in the slaughter-house, to be of brickwork, and the flue to

be properly pargeted, with a second-size chimney pot, well flanched up with plain tiles and Roman cement. The shaft and pot to be coloured stone colour. All the door and window frames to be properly bedded and pointed with good lime and hair mortar, and the sills to be underpinned. To build underpinning of stonework, with proper footings for the partitions where required, and foundations for the stone bases to the cattle-shed. To put a coping of semicircular bricks, 14 inches wide, to the fence wall, the back of the hay-store, and the front of the pigsties, set in Roman cement, with proper stay irons at all the coins. To fill in the nogging partitions with brick nogging flat. To pave the four fowl-houses with paving bricks, flat bedded and jointed in mortar. To pave the coal places, pigs' lodgings, and slaughter-house with brick stock paving on edge in sand. The passage, cow-house, calf-pens, cattle-shed, hay-house, and pigs' yards to be paved with pebbles laid in sand, properly currented and rammed. To build and pave proper swill cisterns of brick, set in Roman cement, and rendered inside with the same, so as to be perfectly watertight. To colour twice over in good stone colour the brickwork of all the coins, arches, and coping. To lime-white the inside of the slaughter-house and fowl-houses. To bed all the plates, bond, templets (short pieces of timber laid under girders and beams, to distribute the weight), and lintels, in mortar. To cover the roof of the cattle-shed and hay-store with pantiles jointed in mortar; to build foundations for the posts, and to cover all the other roofs with hoop chips from large hoops, finding straw, binders, rods, twine, &c., and laths. The bricklayer is to find all the materials, carriage, scaffolding, tools, workmanship, and ironwork for the completion of his work, in the best and most substantial manner. The whole to be done under the inspection and to the satisfaction of the Architect, subject to the several conditions contained in the general particular at the end hereof.

[Signed by the bricklayer, in the same form as before.] S. B.

869. *Carpenter and Joiner.* The whole of the materials to be provided and sawed out square, free from wane, of the several scantlings herein specified; to be carted to the spot by the contractor, and to consist of the best yellow Dantzic or Memel fir, or English oak, free from sap, shakes, or large loose knots. To frame the whole of the carpentry in a workmanlike manner, according to the drawings; finding labour, nails, and all kind of ironwork for the purpose, subject to the provisions of the general particular at the end hereof. — Waggon-house with Granary over To put oak story posts (upright timbers supporting brestsummers or girders), 9 inches by 9 inches, and circular braces, 8 inches by 9 inches, wrought, framed, and chamfered; each post to have a square iron tenon let into the stone base. To put wall plates of oak under the floor and roof, 4 inches and a half by 2 inches and a half, with fir sills to the external partition, 12 inches by 6 inches. To put fir girders, 12 inches by 12 inches; each girder to be fixed with a three quarters of an inch iron screw pin and nut to the sill, and to have an iron tie, with an S iron through the wall, properly spiked to the girder. The joists to be framed into girders, 12 inches by 2 inches and a half, 12 inches apart. The external partition to have principal quarters, 6 inches by 6 inches, with common quarters and braces, 12 inches apart, 6 inches by 3 inches and a half; head, 6 inches by 6 inches, covered with oak or yellow deal weather-boarding and fillets, with flanch board and brackets at bottom. To lay the floor with inch and quarter yellow deal, wrought, ploughed, and tongued. To put 3 tiers of bond, 4 inches by 3 inches, in the walls of the granary. To put fir proper window frames, filled in with three quarters of an inch deal wrought luffer-boards housed into the frames; with oak wrought and beveled drip sills to the front and back windows. To put an oak proper doorcase, 5 inches by 3 inches and a half, to the granary, with oak drip sill, 9 inches by 3 inches and a half, with inch and quarter deal proper ledged door, hung with strong hook and eye hinges, and with a strong iron-rim lock. To put a step-ladder of 2-inch oak, with the steps housed into the sides with three iron screw braces and nuts. The steps to be fixed with strong iron hook and eye hinges to the sill. — Roof. To put fir tie beams, 9 inches by 4 inches; king posts, 9 inches by 3 inches, with three quarters of an inch iron screw pins 2 feet long, with nuts 3 inches long, mortised through the king posts; struts, 3 inches by 3 inches; framed principal rafters, 6 inches and a half by 3 inches at bottom, and 5 inches by 3 inches at top, fixed at each end with screw pins to the tie beams. Purlins, 5 inches by 3 inches, notched on the back of the principal rafters. Pole plate, 4 inches and a half by 3 inches; common rafters, 13 inches apart, 4 inches and a half by 3 inches; ridge pieces, 9 inches by 1 inch and a half, with oak eaves board. The joists, to receive the pigeon-house floor, laid on tie beams, are to be 6 inches by 2 inches and a half, trimmed for a trapdoor; the floor is to be of inch deal, rough, with edges shot, ploughed, and tongued, with trapdoor and hinges, and step-ladder, complete. To put 1 inch and a quarter oak shelves and penthouse to the pigeon-holes, with oak cantilevers to support them. A rough partition to be put across in the roof, covered with weather-

boarding, with a door, hinges, and lock, to go into the pigeon-house end. — Cattle-shed and Hay-house at the back of the Granary. To put fir posts, 7 inches by 7 inches, wrought, framed, and chamfered, with iron tenons and braces circular on plan, 6 inches by 3 inches; fir plates, 7 inches by 4 inches; pitching piece, 4 inches and a half by 3 inches; tie beams, 7 inches by 4 inches; principal rafters, 5 inches by 3 inches; struts, 3 inches by 3 inches; purlins, 5 inches by 2 inches and a half; common rafters, 13 inches apart, 4 inches and a half by 2 inches and a half, covered with pantile laths, with oak feather-edge eaves boards. To put oak proper door-case and sill to the hay-house, 5 inches by 3 inches, with 1 inch and a quarter yellow deal proper ledged door, hung with strong hook and eye hinges, strong Norfolk latch, and 8-inch stock lock. — Cow-house, Calf-pens, and Slaughter-house. To put oak sills to the external partition in front, 6 inches by 3 inches, with fir principal posts, 6 inches by 3 inches; common quarters and braces, 5 inches by 2 inches and a half; the head, 6 inches by 3 inches; oak wall plates, 4 inches and a half by 3 inches. The front to be covered with weather-boarding at bottom, and with open filleting (slips of deal nailed at one or two inches apart), at top; to put oak proper door-posts, 5 inches by 3 inches, with 1 inch and a quarter oak proper ledged doors, with strong hook and eye hinges and fastenings and the same to the slaughter-house. The calf-pens to be parted off with oak posts and arris rails (rails presenting two surfaces to the eye, which two surfaces unite in forming an edge or arris between them), filled in with oak slabs, with a small gate hung on hook and eye hinges, with a hasp and staple. To put proper cow-bows (a contrivance for fixing the cow's head over the manger) and mangers for twelve cows. To put an oak proper 2-light window frame, and oak drip sill with iron casement, to the slaughter-house. To put tie beams, 7 inches by 4 inches; struts, 3 inches by 4 inches; principal rafters, 5 inches by 3 inches; purlins, 5 inches by 2 inches and a half; common rafters, 4 inches and a half by 2 inches and a half; ridge pieces, 9 inches by 1 inch and a half, with oak eaves board. — Fowl-houses and Piggery. The roofing to be of the same scantlings with oak eaves board, as last described; and the window frame in the swill-house the same as that in the slaughter-house. The door and doorcases the same as those in the cow-house, with 8-inch stock locks. The partitions of the fowl-houses to be framed for brick nogging flat, with oak sills, and English fir puncheons (short pieces of timber used in framing partitions). The front of the pigsties to have oak sills with fir puncheons, 4 inches by 2 inches and a half, covered with weather-boarding. The division of the sties and of the back partition to be of oak posts, 5 inches by 5 inches, with arris rails, and filled in with oak slabs. The pigsty doors to have oak frames wrought and rebated, with inch oak wrought ledged doors, with strong hook and eye hinges, and hasp and staple fastenings. To find and fix five pig troughs of cast iron, 6 feet long each. To put a proper wrought framed and beveled oak curb to the swill cisterns, 6 inches by 2 inches and a half. — The three Gates. To put oak posts wrought and chamfered, 9 inches by 9 inches, with proper sills, subsills, and braces, to the wide gates. To put cast-iron moulded and beveled caps, as in fig. 898, to the posts. To put yellow deal, 2 inches and a half, wrought, framed, and braced gates, filled in with inch yellow deal, wrought, ploughed, tongued, and beaded, with proper strong wrought-iron hook and staple hinges; the staples to be fixed with nuts and screws, and bar fastenings; the large gate to be a folding one. All the gates to have wrought, beveled, and moulded capping, and strong Norfolk latches. To put 1 inch and a half oak pump cheeks and sill; to case the same with inch deal, with proper cap, and fix the same where required. To make a proper barrel curb for the well.

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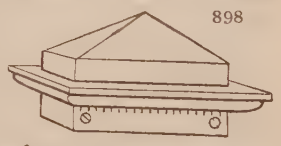

[Signed by the contractor, as before.]

R. S.

870. *Plumber, Glazier, and Painter.* To put lead lights and glass to the window frames in the slaughter-house and swill-house. To put a lead flashing, 5 pounds to the foot superficial, to the roof of the cattle-shed and hay-store, 12 inches wide, worked into the joint of the stone wall of the granary and coping, and also to the shaft of the chimney to the slaughter-house. To put a good stout 4-inch lead pump barrel, weighing 2 quarters 14 pounds, with 50 feet of 2 inches and a half lead suction pipe with bucket, sucker, and iron handle complete. To paint all the gates, doors, and window and door frames, inside and out, and all the weather-boarding outside four times in good oil colour. The work to be done, finding all materials, workmanship, and carriage, subject to the provision of the general particular at the end hereof.

[Signed, &c., as before.]

W. B.

871. *Stone-Mason.* To provide and fix Portland stone bases, properly tooled and beveled, for the story posts of the granary and the cattle-shed, and to fix iron tenons in

them run with lead. To be done subject to the provisions in the general particular at the end hereof.

[I, the undersigned, hereby, &c., as before.] W. G.

872. *General Particular.* See that at the end of the particulars of the cottage, § 854.

873. *Measurement and Estimate.* Account of the quantities of the several works required in building the farm-yard at Bury Hill, with an estimate of the expense of performing the same.

874. *Bricklayer, Excavator, and Well-digger.* A. M.

176 cubic yards and a half, digging, filling, and ramming in again; the surplus earth to be wheeled to any distance not exceeding 50 yards .....
10 rods 248 feet reduced of stonework grouted. .....
21 rods 73 feet, ditto, above ground, with garreted joint .....
92 feet reduced of brickwork .....
45 feet ditto ditto, set in Roman cement .....
205 feet ditto of brickwork, in dry steening, without labour.....
8 squares 83 feet superficial pantiling pointed .....
63 squares and a half superficial hoop chip thatch, with chips from large hoops, including laths and every thing .....
178 yards lime-whiting .....
8 yards stone-colouring .....
27 yards brick nogging flat .....
41 yards rendering in Roman cement.....
29 yards paving bricks flat bedded and jointed in mortar.....
7 yards paving bricks in cement; two courses of bricks, and one course of plain tiles (in swill-cisterns) .....
63 yards stock paving on edge in sand .....
226 yards pebble paving .....
94 feet, run one half round, 14 inches brick coping set in cement ...
30 feet verge in cement .....
30 feet deep of well-digging, and labour to steening.....
15 feet ditto ditto (extra-depth).....
1 chimney-pot and flanching, with tiles in cement.....
3 stay irons to coins of coping.....
6 window frames bedded and pointed.....
16 door frames ditto .....
Forming cattle-yard, with dish and current.....
Colouring the coins, arches, and coping stone colour .....

£ 570 : 19 : 11

875. *Carpenter's and Joiner's Work.* A. M.

37 feet 1 inch cubic Dantzic fir in bond plates, &c. .....
943 feet 8 inches cubic ditto, framed in roofs, floors, and partitions...
5 feet cubic proper doorcase and window frames .....
40 feet 6 inches cubic oak in plates, &c. .....
20 feet 5 inches cubic ditto, framed .....
80 feet 7 inches cubic, wrought, framed, and chamfered .....
33 feet 6 inches cubic, ditto, ditto, cut circular .....
3 feet 11 inches cubic drip sill, wrought, framed, and beveled .....
3 feet 9 inches cubic wrought, framed, and beveled curb to pigsty ...
33 feet 1 inch cubic oak proper doorcase ... .
25 feet superficial three quarters yellow deal lining .....
93 feet 4 inches superficial three quarters luffer-boarding.....
18 feet 5 inches superficial inch yellow deal wrought pump casing ...
9 feet superficial inch ledged flap.....
46 feet 10 inches superficial inch oak proper ledged door .....
7 squares 82 feet superficial inch weather boarding.....
7 squares 79 feet superficial inch yellow deal floor rough, edges shot, and ploughed, and tongued.....
7 squares 79 feet superficial 1¼-inch yellow deal floor, wrought, ploughed, and tongued.....
247 feet 9 inches superficial 1¼-inch proper ledged door .....
20 feet 3 inches superficial 1¼-inch wrought oak shelves to the pigeon house.....
9 feet 9 inches superficial 1½-inch oak pump cheeks .....
23 feet 10 inches superficial 2-inch oak wrought sides to ladder .....

87 feet 2 inches superficial 9-inch oak wrought and beveled.....
82 feet 8 inches superficial 1½-inch yellow deal ridge.....
76 feet superficial 2½-inch yellow deal wrought, framed, and braced folding gates, filled in with inch deal, wrought, ploughed, and tongued.....
96 feet superficial slab filling in .....
51 feet superficial rough partition and boarding with ledged door.....
8 squares 64 feet superficial pantile lathing.....
8 squares 29 feet superficial partition for nogging flat .....
2 squares 47 feet superficial partition to the front of the pigsties.....
4 squares 7 feet superficial enclosure of posts, arris rails, and slabs ....
30 feet run throating in oak .....
488 feet 6 inches run oak eaves board.....
14 feet 6 inches run fir beveled and moulded capping .....
80 housings to luffer-boarding.....
34 ditto to steps.....
2 oak cantilevers cut.....
1 step-ladder, made complete, to go into the loft over the granary.....
6 posts, prepared and fixed.....
4 arris rails, ditto .....
5 cast-iron pig troughs, 6 feet long.....
1 hole for the pump handle, in oak.....
1 cap to pump case .....
1 barrel curb for the well.....

876. *Ironmongery and Fixing.* A. M.
10 square iron tenons.....
8 ¾-inch iron screw pins and nuts to the girders. .....
8 iron ties, and 8 irons to ditto.....
6 iron screw pins to the principal rafters.....
8 ditto to the king posts .....
2 iron screw bars and nuts to the step-ladder.....
1 iron fastening .....
6 cast-iron beveled and moulded caps to the gate-posts .....
1 bar gate fastening .....
1 pair of strong hook and eye hinges for the granary door .....
1 strong lock for ditto .....
1 pair strong hook and eye fastenings to the granary ladder.....
1 pair 16-inch cross garnet hinges.....
1 pair 18-inch ditto .....
17 pairs of hook and eye hinges to hay-store, cow-house, fowl-houses, &c. .....
4 strong Norfolk latches .....
18 fine plate stock locks .....
7 hasps and staples .....
5 pairs hook and eye hinges to pigsty doors .....
4 pairs strong hook and staple hinges, with nuts and screws.....

£ 388 . 19 : 5

877. *Plumber's, Painter's, and Glazier's Work.* A. M.
24 feet superficial lead lights and glass .....
8 cwt. of lead in flashings .....
50 feet run of 2½-inch suction pipe.....
1 stout 4-inch lead pump barrel complete, with bucket, sucker, and iron handle, and cistern head .....
200 yards superficial painting four times in oils.....
9 lights, in four oils, on both sides .....

£ 80 : 18 : 10

878. *Stonemason's Work.* A. M.
24 feet 8 inches cubic of Portland stone.....
79 feet 8 inches superficial of sunk tooled work.....
10 mortises for iron tenons run with lead .....

£ 12 : 6 : 8

879. *Summary of Estimates.*

Bricklayer	570 : 19 : 11
Carpenter and joiner	383 : 19 : 5
Plumber, painter, and glazier	30 : 18 : 10
Mason	12 : 6 : 8
Total	£ 998 : 4 : 10

880. *General Estimate.* As the number of cubic feet in the buildings of this farmery is 73,383, it appears, from the actual cost, that 3¼*d.* per foot will give a near idea of the price of such buildings similarly circumstanced.

881. *Remarks.* There is no great room for ingenuity of contrivance in a farmery of this description, on a small scale; but the minutiæ of the construction, as given in the particular, will be found very useful to those connected with this department of building. The appearance of the whole, as seen in the isometrical view, fig. 886, is neat, plain, and substantial; the true characteristics of an English farm-yard. The practice of roofing such buildings with hoop chips is little known in Scotland, but is well deserving of imitation in that country; and we should think it would be also found suitable for America and Australia. In some parts of the country the granary would have been supported by stone pillars, instead of oak posts; but it must be recollected that the necessarily increased diameter of the former, occasions a great loss of room in the cart-shed, since no cart can be introduced that will not pass between the pillars.

Design III. — *A Farm House and Farmery suitable for a Farm of Six Hundred Acres of Turnip Soil, executed at Halstone, in Dumfriesshire.*

882. *Accommodation.* The ground plan of the house, and its kitchen court and offices, and of the farmery, and its courts and yards, is given in fig. 899; and the general effect of the whole is seen in the isometrical view, p. 443. In fig. 899 are shown, in the plan of the house, a drawing-room, *a*; dining-room, *b*; parlour, *c*; bed-room, *d*; store-room, *e*; kitchen, *f*; two pantries, *g g*; kitchen scullery, with stair to servants' bed-rooms over it, and the kitchen, *h*; dairy scullery, *i*; dairy, *k*; ash-pit, *l*; and coal-house, *m*. In the farmery are shown a steaming and boiling house, *n*; cow-house for eighteen cows, *o*; hay-house, *p*; two stables for six horses each, *q q*; harness-room, *r*; gateway from the hay-yard and the rick-yard, *s*; cart-house, *t*; barn, with a threshing-machine driven by water, *u*; straw-house, *v*; calf-house, *w*; stable for a sick horse, or mare and foal, *x*; potato-house, *y*; eight cattle-hammels for feeding twenty head of cattle, *z z z*. A turnip-house, *aa*; two cattle sheds and courts, *bb*; hay and green wood house, *cc*; piggeries, *dd*; dung court, *ee*; passage between the dung court and the buildings, *ff*; kitchen court, *gg*; garden, *hh*; hay-yard, *ii*; barn-yard, *kk*; straw-yard, *ll*; grass field, *mm*; and lawn and shrubbery in front of the house, *nn*. The letters *ii* to *nn* will also be found in the isometrical view, p. 443. It will be observed that in this Design there are regular foddering passages to the cattle and cow sheds, and to the hammels; and that the hay and green food houses are judiciously placed adjoining them, for the convenience of having a supply of food at hand. In the stables the horses stand in separate stalls, and the cows are allowed a width of five feet each. Fig. 900 shows a plan of such parts of the buildings as have a second story, with the roofs of the other parts. In this plan, *a* and *b* are two best bed-rooms, with a dressing-closet, *c*, between them; *d* is the chamber lobby, and staircase; and *e* and *f* are two family bed-rooms; *g* is a nursery or lumber room; *h h* are two servant's bed-rooms; *i* is the open yard for ashes and rubbish, in which yard there is a privy; *k* is the hay-house, or house in which food is stored for the cows; *l l* are the hay-lofts over the stables; *m* is the corn-room, over the harness-room; *n* is the granary over the cart-house; *o*, the barn; *p p p*, the yards to the hammels; *q q*, the yards to the cattle-sheds; *r r r r*, the yards to the pigsties; *s*, lobby for supplying food to the four fattening pigsties; *t t* are two sties for breeding pigs, with doors which open to the dung-yard, *u*; *v* is the principal entrance to the farmery from the fields, and from the public road; *w* is the covered entrance from the rick-yard; *x* is an entrance from the straw-yard, in which straw is stacked to be given to cattle as wanted for food or litter; *y* is the entrance from the kitchen court; *z* is the kitchen-garden, and &, the lawn.

883. *Construction.* The walls are of freestone found on the premises, squared, and regularly hewn at all the angles and openings, with stone sills, jambs, and lintels. The roofs are covered with blue slates, and the whole of the court, passage, entrances, and kitchen court, is paved with granite.

884. *Remarks.* This Design was furnished us by Walter Newall, Esq., Architect, Dumfries, under whose superintendence it was erected on the extensive estate of the Duke of Buccleugh in that county. It is remarkably complete in point of accommoda-

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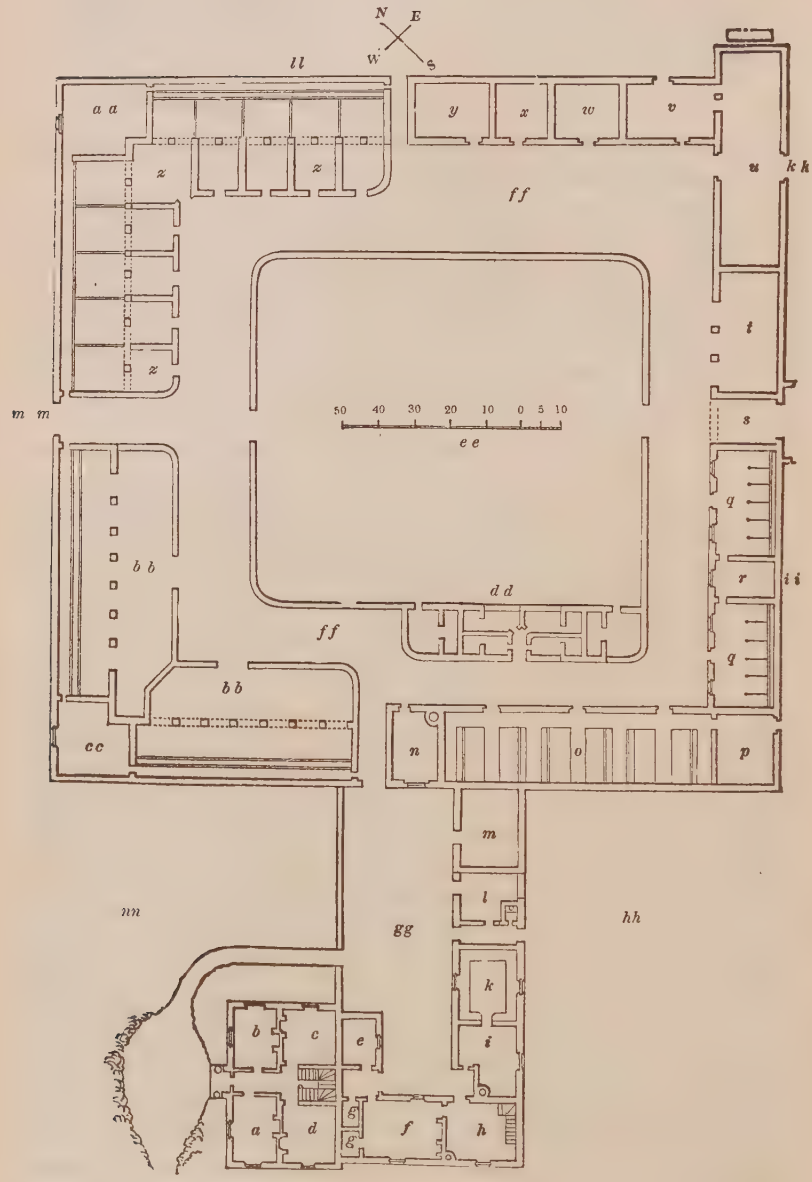
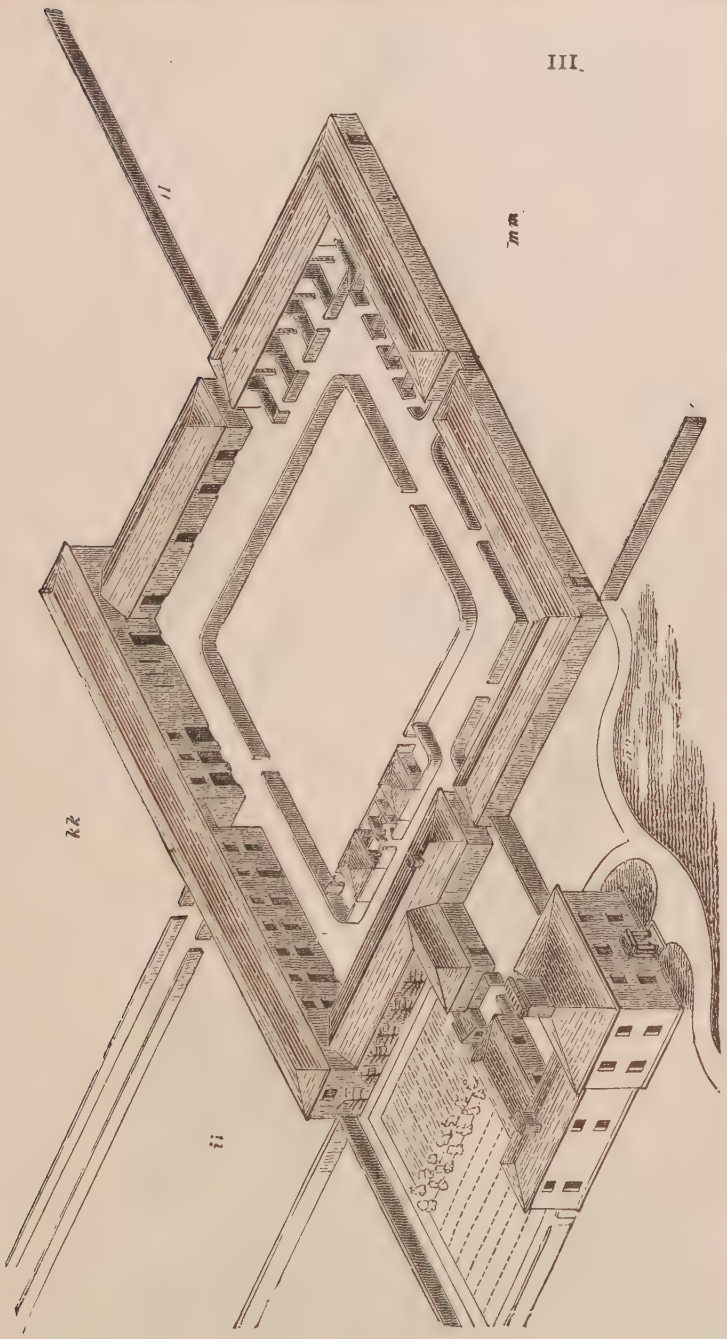
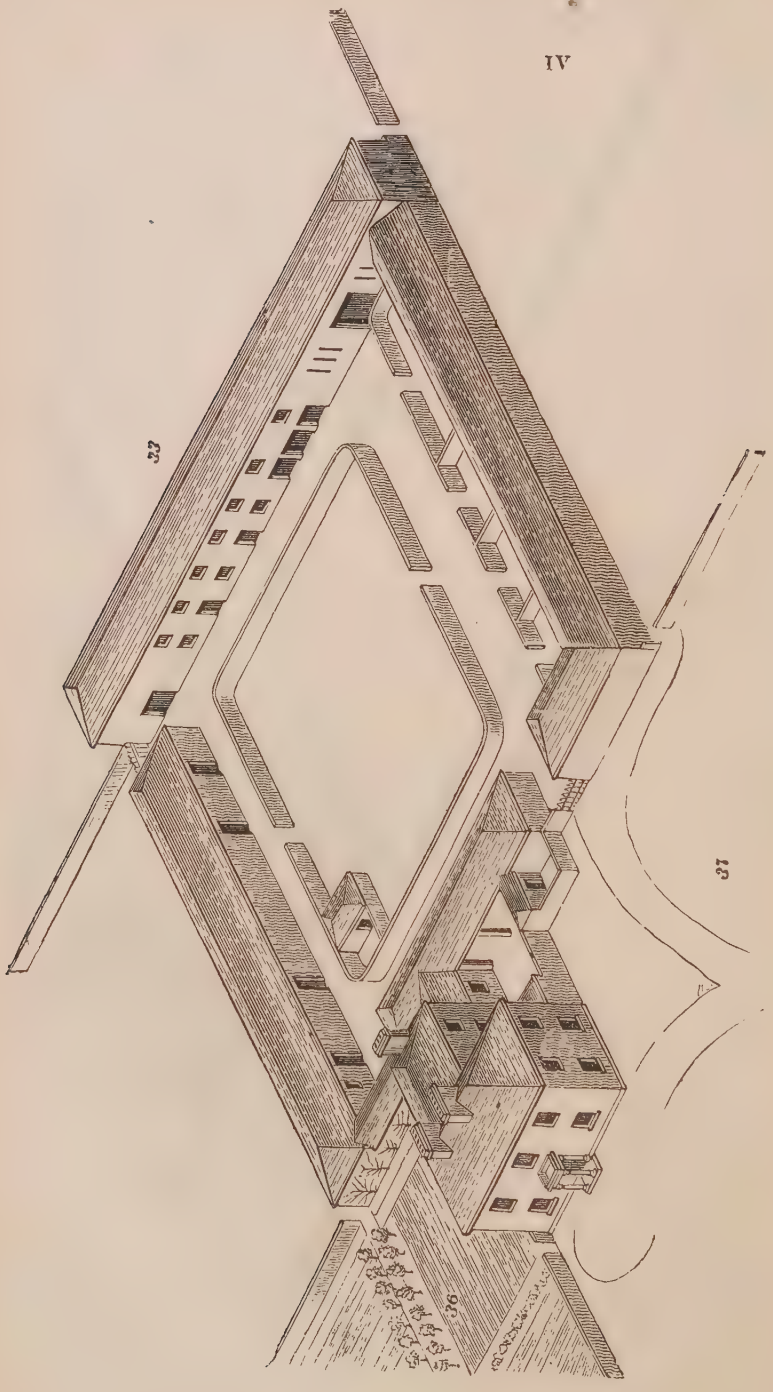


tion; and, like all the buildings erected on the duke's property, is most substantially and durably executed. We observe that there is no poultry-house, and but a very small kitchen-garden; which is characteristic of the Scotch farmers, who care little about the minor comforts. We could suggest some additions to the house, one of which no Englishman, with a dining-room, drawing-room, and parlour, would be without, we mean a water-closet. We wonder, also, that to such a house and yard, there is neither a chaise-house, nor a stable for saddle horses. Why not a green house?

III.

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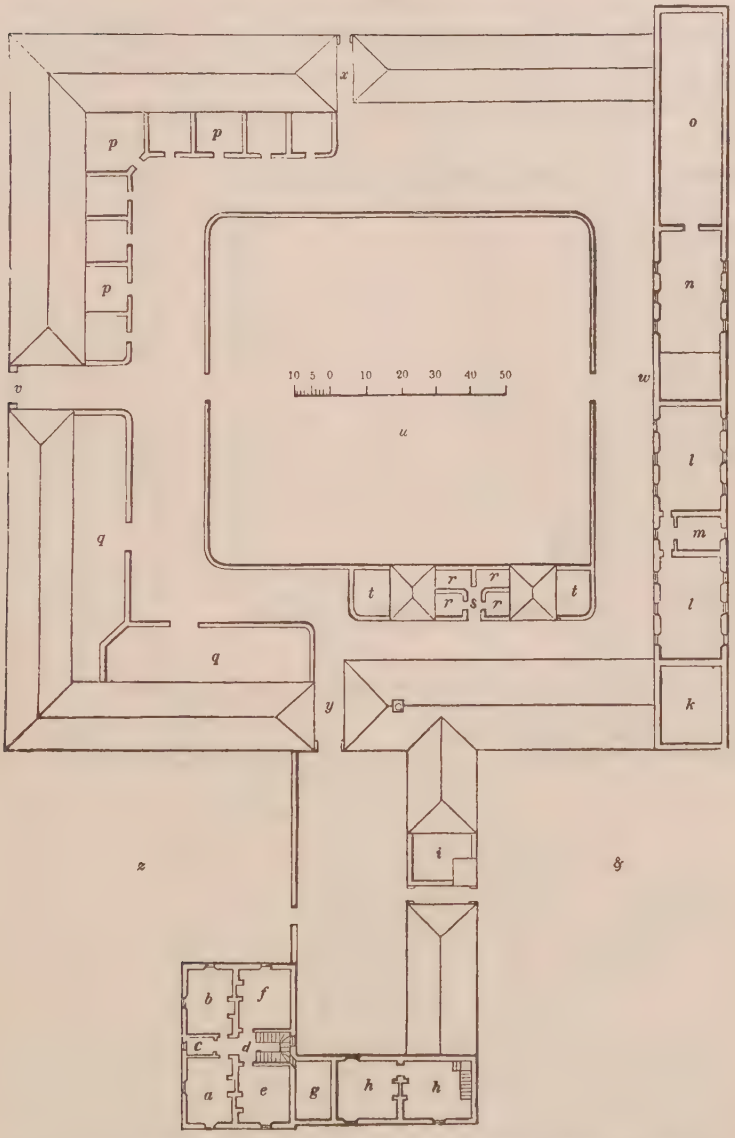
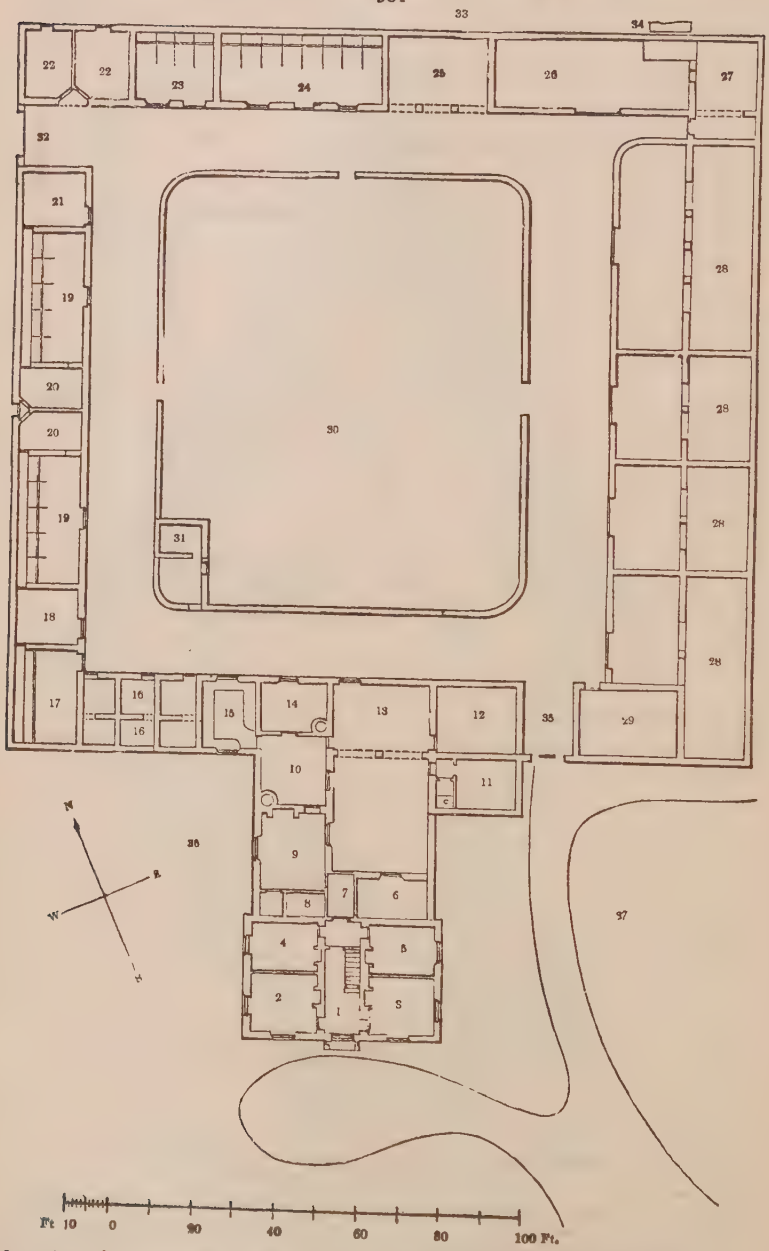


Design IV. — *A Farm House and Farmery, suitable for an extensive Turnip Farm executed at Gatestack, in Dumfriesshire.*

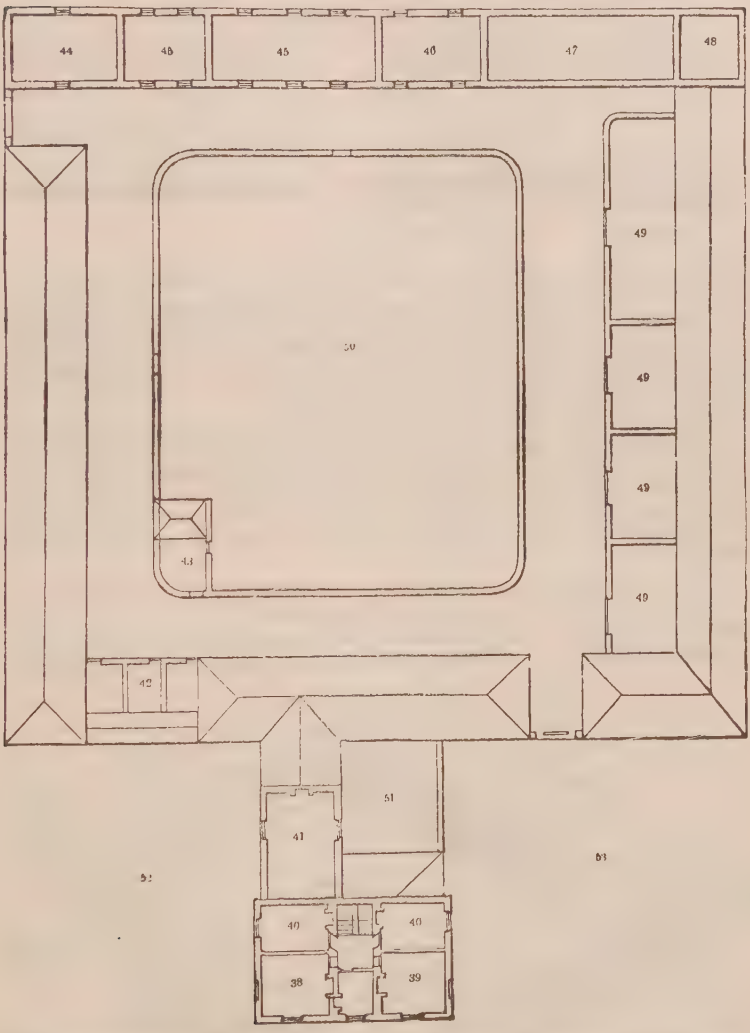
885. *Accommodation.* In the ground plan of the house, fig. 901, there are a lobby, 1; two parlours, 2 and 3; two bed-rooms, 4 and 5; a store-room, 6; back lobby, 7; with a pantry, 8; kitchen, 9; with a small pantry adjoining; scullery, 10; ash pit, 11; wood and coal house, 12; open shed or cleaning room, 13; boiling-house, 14; dairy, 15; pig-houses, 16; feeding-house for cattle, 17; turnip or green food house, 18; cow-houses, 19 19; calf-houses, 20 20; hay-house, 21; potato-houses, 22 22; a stable for four horses, 23; a stable for eight horses, 24; cart-house, 25; barn, 26; straw-house, 27; cattle-sheds and courts, 28; and house for turnips, tares, or clover, 29. In one corner

901



of the dung-court, 30, is a pig-house, 31; the entrance from the rick-yard and the fields of the farm is at 32; the rick-yard is at 33; the water-wheel for the threshing-machine is at 34; and the main entrance at 35. There is a garden at 36; and a lawn, with shrubs and ornamental trees, at 37. The three references 33, 36, and 37 are also introduced in the isometrical view, p. 444. Fig. 902 is the plan of the chamber floor of the house,

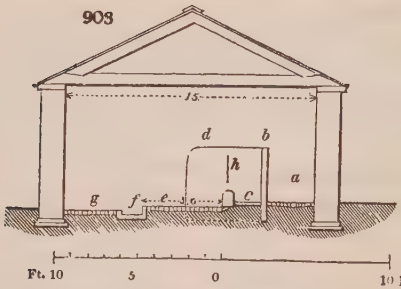
902



and of the lofts and roofs of the farmery. 38 and 39 are two best bed-rooms, with a dressing-closet between; there are two other bed-rooms, 40 40, and a servants' bed-room, 41: 42 and 43 are the yards to the pigsties; 44, the wool-loft; 45, two hay-lofts; 46, the granary; 47, the upper part of the walls of the barn; 48, the straw-house; and 49 49 49 49, the yards to the cattle-sheds. The dung-court is indicated by 50; the kitchen-court by 51; the kitchen-garden by 52; and the pleasure-ground by 53.

886. *Construction.* The walls are of stone, and the roofs slated, with ridge stones of the free red sandstone of the district. Fig. 903 is a cross section of the cow-house, marked 19 in fig. 901; in which may be seen the feeding-passage, two feet and a half wide, *a*; the partition of flag-stone, *b*, which separates this feeding-passage from the feeding-trough or manger, *c*; the partitions between the stalls, formed by single flag-stones, *d*; the level surface of the stall, *e*; the gutter behind, *f*; and the passage, *g*. At *h* a vertical line is shown which indicates a round iron rod, half an inch in diameter, on which a ring runs, and to which the cattle are fastened by halters or chains. Two stand together between each stall. Fig. 904 is a longitudinal section of a part of these

903



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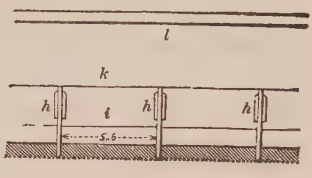


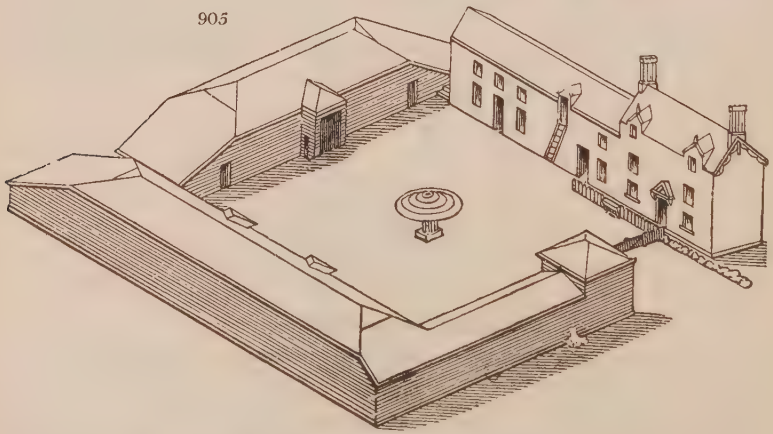
stalls, in which the fastening rods, *h*, are more distinctly seen: *i* is the elevation of the manger; *k*, the partition between the manger and the foddering-passage; and *l*, the top of the side wall. The stalls for every two Ayrshire cows are five feet long from the manger to the gutter, and five feet and a half wide from partition to partition. The manger is one foot and a half wide, and the gutter behind one foot two inches. Each separation partition is a flag-stone four feet and a half long, three feet and a half broad, and six inches thick, let into the ground, to the depth of a foot.

887. *Remarks.* This Design, by Mr. Newall, which was also executed under his superintendence, on the Duke of Buccleugh's estate, affords a very good specimen of a breeding and feeding farmery, where the produce is chiefly consumed in feeding cows for their milk to rear calves, but partly also in fattening cattle for the butcher. The wool-loft bears evidence that sheep form a part of the live stock; and, from the number of stalls for horses, it may be concluded that about 500 acres are annually under the plough.

Design V. — *A Farm House and Farmery for a Farm of* 150 *Acres of Arable and Pasture Land, in Buckinghamshire.*

888. *Accommodation.* Fig. 905 shows the general appearance of the whole; and in fig. 906 the ground plan is exhibited, containing a parlour, 1, with a cellar under it,

905



into which the beer is let from the back kitchen by a pipe, and which is lighted by a window on the garden side: this parlour has a bed-room and attics over it. The front door and stairs are shown at 2; the front kitchen at 3, having a glass door into the garden, and containing the door to the cellar and pantry, with dry cupboards for groceries, &c., and bed-rooms and attics over; 4 is a pantry under a lean-to, the floor of which is two feet under that of the kitchen; the back kitchen, 5, has two coppers, a large oven, a well and pump, and a sink, with men's bed-room over, and stairs to the same; the dairy, 6, is three feet below the floor of the back kitchen. The pantry, oven, and dairy are all under a lean-to roof. There is a wood and coal house, with a granary over, 7; the granary being entered by a swing step-ladder from the yard, as seen in the

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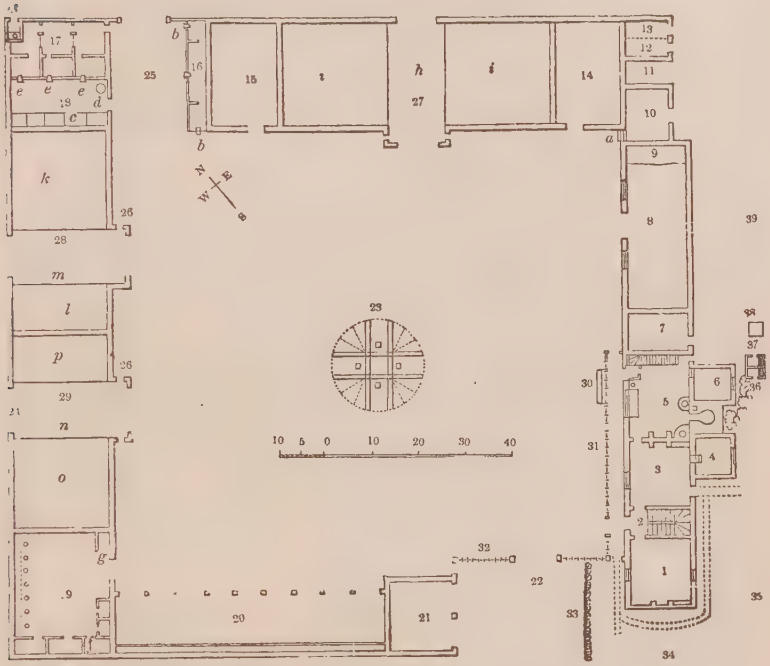

isometrical view; 8 is a stable for six horses, with a hay-loft over; 9 is a chaff or fodder bay at the end of the stable; 10 is a hen-house fitted up with roosting-poles and laying-boxes three feet from the floor; the poultry go out and in at a hatch-hole, three feet above the surface of the yard, by means of a short ladder fixed at *a*. The entrance to the potato-house, which is under 14, is at 11; 12 is a duck-house; and 13 a goose or turkey house: both these houses, together with the hen-house, are under a lean-to roof; and the potato-house is under the straw-house and barn, 14 and 27; 15 is a straw-house; 16, store pigsties, the ends of the feeding-troughs shown at *b b*; 17 are fattening pigsties; 18, a meal-house, with five bins, *c*, for meal and dry food of different kinds, with a large hog-tub, *d*, for liquid food, and showing the ends of three feeding-troughs at *e e e*; 19 is a cow-house, with calf-pens at one end, *f*, and a hay-bin or cupboard in one corner, *g*; 20 is a cattle-shed, with a rack and manger; 21 is a waggon and cart lodge, the entrances to which are outside of the yard; 22 is the principal gate of entrance, made of oak, nine feet wide with five bars, and a strong diagonal brace; 23 is a circular open shed or hovel, for sheltering cattle while eating, with a rack under; 24 is the rick-yard; 25 is the gate from the fields; 26, small doors of the barns, with locks; the large doors bolting in the inside in a manner which will be mentioned hereafter; 27, wheat barn, consisting of a threshing-floor, *h*, and two bays, one at each side, *i i*; 28 is the barley-barn, consisting of two bays on one side, *k*, and one bay on the other, *l*, and a threshing-floor between, *m*; 29 is the oat-barn, with a threshing-floor, *n*, a double bay for unthreshed corn on one side, *o*, and a single one on the other, *p*; 30 is a water-trough for supplying the horses and cattle with drink, filled from the pump in the back kitchen by means of a spout through the wall; 31 is a light open fence or palisade; 32 is a fence of oak pales; 33, a hedge; 34, a lawn, with groups of shrubs and flowers; 35, a kitchen-garden; 36, a best privy; 37, a privy for the female servants; 38, wood-stack; (these last three being represented some yards nearer the house than they really are, in order to bring them within the compass of the plate); 39, orchard; 40, privy for the men-servants; and 41, hollow basin sloping on every side, to receive the waters of the yard and the dunghill.

889. *Construction.* The dwelling-house is built of brick, and is covered with plain tiles; all the other buildings are of timber in frames filled in with studwork, and covered outside with weather-boarding; their roofs are of plain tiles, with the exception

of that of the cow-house, cart-house, and central hovel, which may be thatched with straw, chips of wood, or spray. The walls of the cart-shed, 21, are frames filled in with studwork, into which branches of furze are thickly wattled, a species of covering which lasts several years, and is easily renewed. Where furze is not abundant, common spray may be used. Fig. 907 is a section across the round hovel in the yard, to show its construction. Four posts are fixed in the ground, which at the height of ten feet support four horizontal pieces, each twelve feet long, and placed at right angles, as shown at 23, in fig. 906; on these, poles of any sort are laid so as to form a circular flooring, on which faggots are built in such a manner as to form a cone, and these are slightly covered with straw or chips so as to throw off the rain. A round fodder-rack is formed on the ground, by placing four short posts in such positions as that they will form a circle with the four long ones, as shown in the plan, fig. 908, in which *q* shows the long posts for supporting the roof; *r*, the short ones for the frame of the rack; *s*, the horizontal joists placed at right angles to one another; *t*, the rough poles, placed diagonally to the joists; and *u u*, the short poles, or branches, laid on the others, to form a flooring for the faggots. Fig. 909 is a section of the wheat-barn, to show the framing of the principal timbers, six of which frames form the two ends, and the five intervening spaces called bays. The central bay is the threshing-floor, which is laid with joists or sleepers, across the potato-pit, or cellar, *v*, which, as before mentioned, is entered from one end of the barn, at 11, in fig. 906. The sleepers are generally of oak or beech, and they are covered with oak planking, an inch and a half or two inches thick, halved into one another along the edges, or tongued and grooved. Along the sides of the threshing-floor are what are called mowsteads, *w*; which are generally frames of woodwork boarded, carried up to the height of two feet and a half or three feet, with a coping of wood, to separate the corn which is being threshed, from the unthreshed corn on one side, and the corn or straw on the other. Fig. 910 is a section across the porch of the barn, showing the doors removed, and the position of the barn-door lift. In this section, *a* is the sill of the door, six inches square, sunk level with the threshing-floor, and supported by two stout posts or wheel-pieces, *b b*; *c c* are posts eight inches by six inches, framed to the sill at their lower end, and at the upper end to the top plate *d*, which is six inches square. The inner angle of the front of the posts is rebated one inch for the shutting of the doors, *e e*. These doors are made of inch deal, nailed to stout ledges or back boards, which lock into each other by means of their beveled ends, as shown by the dotted lines in *e e*. The doors are hung with strap hinges, on stout hooks driven into the posts; and they shut against, and are fastened to, a movable bar, *f*, which fits into mortises, one of which is a trap mortise, in the posts. To this bar the barn-cloth, *g*, is hung by loops of tape: it is let down when threshing is going forward, to prevent the corn, which flies up in all directions from the flail, from falling over the lift, *h*. This lift is made of inch deal ledged, two feet four inches high, and fits into grooves chiseled out of the spur pieces, *i i*, spiked to the sill and posts. The barn doors swing two feet above the level of the floor of the barn, in order that they may not be obstructed by the litter in the yard. The back door of a barn of this description has no porch, neither is it usually made so large as the front door: if it allows an empty cart or waggon to pass out, for which an opening eight feet wide and ten feet high will be sufficient, that is all that is required; for these doors are only used for taking out a cart after it has been unloaded in the barn; it being dangerous to back a thill or tram horse on the threshing-floor, which, from its smoothness, is generally slippery. Such doors are also used for taking in corn by manual labour from the rick-yard. Fig. 911 is a view of the side of the barn-door porch, in which is shown the base of brick or stone work, *k*, with a coping of wood, *l*, forming a sill to the small lock-up door, *m*, which is shown at 26, in fig. 906. The thresher, on leaving his work at night, makes fast the large double doors by means of the movable bar *f*, and, passing out by the small door, locks it, and secures the whole. The wall or eaves plate of the barn, it is to be observed, is carried directly through the porch, for the greater

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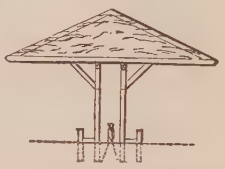

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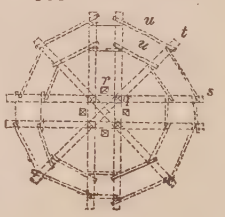

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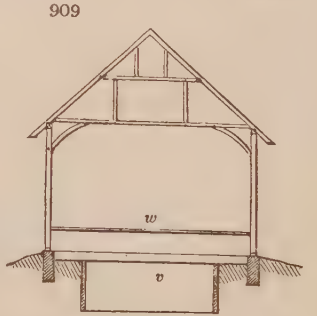
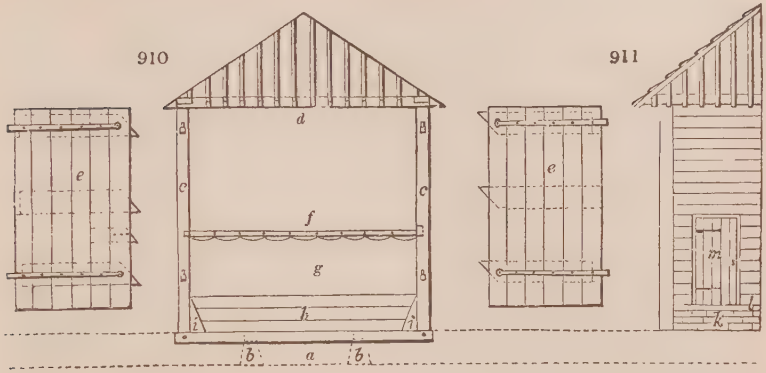
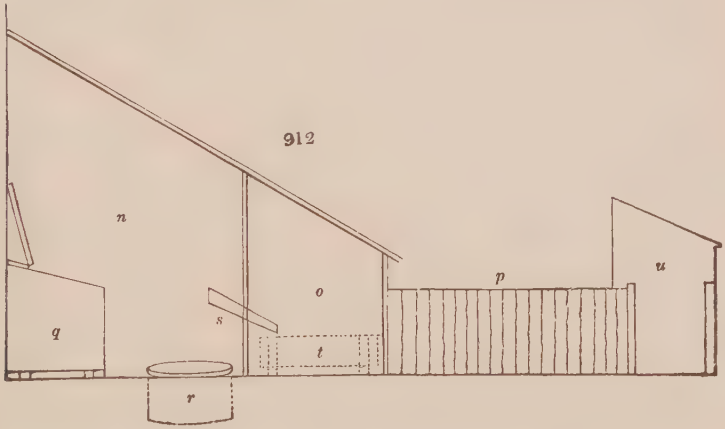
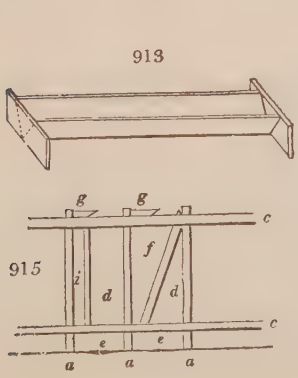


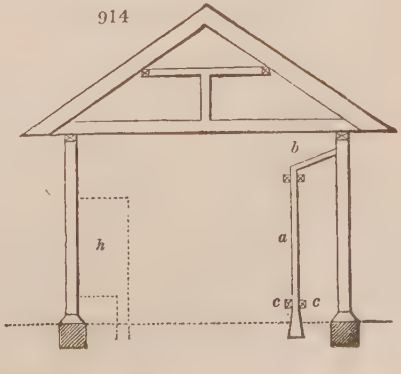


security of the structure. Fig. 912 is a section across the meal-house, *n*; covered part of the pigsties, *o*; and pigs' yard, *p*, in which is seen the bin, *q*; hog-tub, *r*; shoot, *s*;



hog-troughs, *t*; and in the background the end of the man's privy, *u*. The hog-troughs are formed of two long boards, and two short ones, in the very simple manner exhibited in fig. 913. Fig. 914 is a section across the cow-house; and fig. 915 is a longitudinal view of the cow-stall, in order to show the manner of fastening the cows to it. In these





figures, *a a a* are upright pieces of oak three inches square, sunk in the ground at the lower end, and kept steady by braces, *b*, at their upper ends. At a foot from the ground, and also near the top, these posts have double ledges, or horizontal pieces, *c c*, nailed on behind, and in front, for the movable cheek-pieces to traverse in; they being fixed with pivots at *e e*. These pieces lean back to admit the cow's head at *f*, and they are then moved to a perpendicular position, as shown at *i*, and kept in place by catch-pieces, *g g*, which have mortise holes which fall down on tenons on the ends of the cheek-pieces: these catch-pieces also move on pivots, which are fixed in the uprights. The calf-pens, *h*, at the further end of the cow-house, are enclosed by boards five feet high from the ground, with a door to each; but the floor of the pen is raised one foot above the floor of the cow-house, and is formed of stout oak boards pierced with holes to allow the escape of urine: each pen has a door two feet wide. The drainage of the yard is to a hollow space between the pigsties and the central hovel; this space being central to the piggeries, the stable, the cow-house, and the cattle-shed, which are the great sources of manure, and to the three barns, which are the great sources of litter. In this situation the dunghill is at the farthest point from the house; and, therefore, least likely to be offensive by its smells. There is an open gutter surrounding the interior of the yard, so as to receive the water from the eaves of the roofs, and conduct it out by the back gate, there to irrigate a grass field.

890. *Remarks.* This Design was furnished us by Mr. Main, who informs us that it is very nearly a fac simile of the Warren Farm in the parish of Chalfont, Buckinghamshire. It does not exhibit the modern improvements of a threshing-machine, or a liquid manure tank; but, considering it as a farm house and farmery of the old school, it is, perhaps, as complete a thing of the kind as is any where to be met with. There is nothing superfluous or extravagant, and yet nothing wanting, either for the business of the farm or the comfort of the farmer. As compared with the two spacious Scotch farmeries before given, we cannot help remarking the difference between the essential requisites in the appendages to an English and a Scotch farm house. Here, in a house for a farmer occupying only 150 acres, and that of poor flinty clay, we have every convenience for baking, brewing, and keeping ale and beer; a large pantry, and a large dairy; poultry-houses for three kinds of poultry; and well contrived piggeries and calf-pens. Besides the lawn or flower-garden, and the kitchen-garden, there is an orchard; for apple puddings and damson pies are necessaries of life to the English farmer, though they are hardly ever seen on the table of a Scotch one, whose indulgence in this way lies in marmalades, jellies, and other sweetmeats. There are no less than three privies to this comparatively small establishment, while there is but one to each of the magnificent Scotch quadrangles, p. 442 and p. 446, the dwelling-house to one of which has three sitting-rooms. The propriety of the situation of the privies, in Mr. Main's Design, is also worthy of notice: that of the workmen being placed in the most obscure corner of the yard, and that of the maid-servants being near the wood stack. In countries where the threshing-machine is in general use, the smallest of the barns would have sufficed; and, in others where the importance of liquid manure was fully understood, there would probably have been a liquid manure tank under the dunghill, communicating by underground gutters with the stable, cow-house, and pigsties; and probably, also, the dunghill would have been covered with a roof: but these constitute the chief improvements which would probably be introduced, if this farmery were to be reconstructed at the present day. Looking at it as a piece of Architecture, it will give no pleasure to the Architect, as an artist, because it does not display externally any thing of architectural style; but that it has the beauty of fitness in an eminent degree, and that it is characteristic of an English farmery built of timber, we think no one will deny who has gone over the details.

Design VI.—*A Farm House and Farmery for a Farm of* 600 *Acres of Turnip Soil, in Ayrshire, under a Rotation of Five Years, and employed partly in breeding and partly in feeding Stock.*

891. *Accommodation.* The general appearance is shown in fig. 917; and the ground plan in fig. 918. The ground plan of the house shows a common parlour, 1; best parlour or dining-room, 2; kitchen, 3; scullery, 4; pantry, 5; and dairy, 6. The chamber floor, fig. 916, contains two good bed-rooms, *a*, *b*; two second-best bed-rooms, *c*, *d*; a lumber-room, *e*; a maid-servant's bed-room, *f*; and three closets, *g g g*. The farmery, fig. 918, exhibits a stable, 7, for eight horses in separate stalls, forty-eight feet by sixteen feet; a hay-house, 8, eighteen feet by sixteen feet; another stable, 9, for nine horses in separate stalls, fifty-four feet by sixteen feet; a cart-house, 10, for seven carts, fifty-four feet by sixteen feet; a tool-house, 11, eight feet by sixteen feet; a cart-way, or place for backing a cart loaded with

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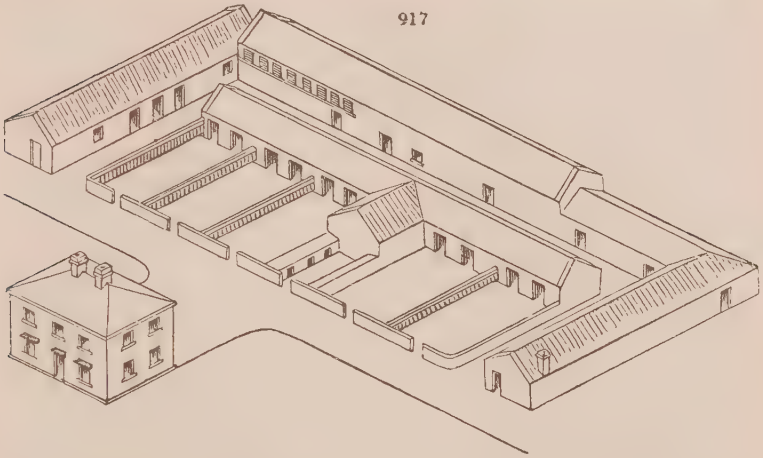
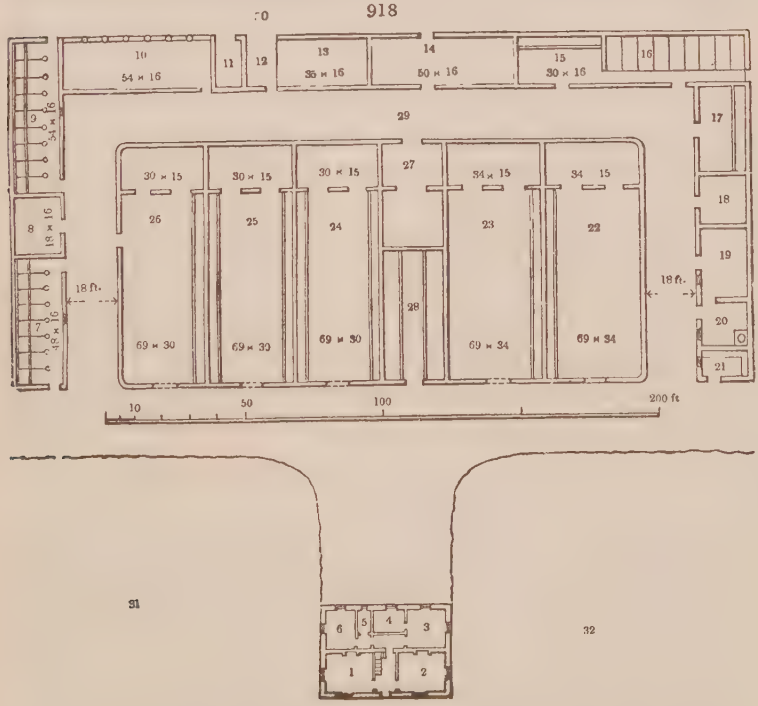
917



corn, 12, twelve feet by sixteen feet; a barn, 13, thirty-five feet by sixteen feet; a straw barn, 14, fifty feet by sixteen feet; a cow-house for eight cows, 15, thirty feet by

918



sixteen feet; a calf-house, 16, forty-nine feet by sixteen feet; another cow-house for eight cows, 17, thirty feet by sixteen feet; a house for a mare and foal, 18, seventeen feet by sixteen feet; a potato-house, 19, twenty-five feet by sixteen feet; a boiler-house, 20, sixteen feet by sixteen feet; a poultry-house, 21, sixteen feet by ten feet; five cattle hammels, 22 to 26, two of them thirty-four feet by fifteen feet, with sheds and yards sixty-nine feet by thirty-four feet, and three of them with sheds thirty feet by fifteen feet, and yards sixty-nine feet by thirty feet; these yards to the hammels have each a fodder rack along the whole width of one side; a shelter shed, and yard for

young horses, 27, the former twenty feet by fifteen feet, and the latter twenty feet by seventeen feet; and, finally, two ranges of pigsties, 28, each range containing three sties, six feet wide and twelve feet long, with a passage between, six feet wide. There is a paved way between the yards and the buildings, 29, which is eighteen feet wide. The rick-yard is placed to the north side of the farmery at 30, and the kitchen-garden to the south-west side at 31; the lawn is on the south front of the house, and the orchard, 32, is on the east side.

892. *Construction.* The walls are of rubblework, and the roofs are slated or tiled. The greatest width of any of the buildings, except the house, is sixteen feet within the walls; and, the walls being eighteen inches thick, this gives nineteen feet for the tie beams of the rafters, supposing them to be placed on the wall plates; but, as in buildings of this description, in the northern counties of the island, they are generally placed three feet higher, their length will be about fifteen feet.

893. *Remarks.* This Design has been sent us by Mr. Donaldson, land steward to the Marquess of Hastings, at Loudon Castle, Ayrshire, a scientific agriculturist, who studied the theory of his profession under the late Dr. Coventry, and its practice in Northumberland. The following remarks accompanied the plans and elevations:—"This plan may be altered to suit circumstances. If the stack-yard stand on the east or west side, the barn and cart-shed must be shifted to the wings; but they should, if possible, be central. The granary is over the cart-shed, and has a communication with the barn by an inside stair. The stables have lofts to hold hay and straw; and, having a communication by means of these lofts with the granary, corn, &c., may be discharged into the corn chests or bins in the stables, without any out-door carriage. The grain in bags for the market is intended to be let down into the carts in the shed through a trapdoor in the floor, by means of a cord and pulley. The feeding-yards may be divided by a cross wall, if thought too large; and shelter sheds may be erected on the sides, but not in front, as that would exclude the sun from the yard behind. Feeding cribs or racks may be erected in the shelter sheds, if thought necessary, to admit of the cattle eating under cover. In the calf-house each calf has its own apartment, with a slip or sliding board in the door, through which it receives the milk. The pigsties have a back door for discharging the dung made in them into the yards of the hammels; and the floors of these pigsties are raised considerably above the level of the yards. They are designed on the plan of keeping swine for eating the offal made on the farm; but, if they are kept on a larger scale, the plan must be more extensive; and perhaps the oval form, with a boiler in the centre, as recommended by the late Mr. Arthur Young, will be found the most convenient. The cattle yards and sheds, and the paved way, have an inclination to a point, where an iron grate receives the water, and conveys it to an arched conduit leading through the centre of the homestead or farmery; which conduit discharges the water at some convenient place for irrigating grass land. Each of the open yards ought to be supplied with water from a pump, for the placing of which no particular directions can be given, as much depends upon situation and circumstances. This dwelling-house and farmery are constructed in a plain substantial manner, and nothing is done for show: but decorations may be added according to the taste and ability of the proprietor." The above plan we consider a most excellent one; there is nothing that we should wish to add but a few conveniences and appendages to the house, which might be contrived in a small kitchen court between it and the farmery.

Design VII. — *A Farm House and Farmery for three Ploughs, erected at Ingleston in Dumfriesshire.*

894. *Accommodation.* The general appearance may be seen in the isometrical view, fig. 919, and the ground plan in fig. 920. The house contains a parlour, *a*; kitchen, *b*, with a closet under the stairs; bed-room, *c*; another bed-room, *d*; scullery or back kitchen, *e*; and dairy, *f*. The farmery contains a pigsty and yard, *g*, for store pigs; two sties, *h h*, for fattening pigs; a cattle shed and court, *i*; a house for stirks, *k*; stable for six horses, *l*; cart-house, *m*, for four one-horse carts; barn, with a threshing-machine driven by water, *n*; straw-house, *o*; byre or cow-house, *p*; calf-house, *q*; and dung yard, *r*.

895. *Remarks.* This Design, furnished us by our excellent contributor Mr. Newall, was erected under his superintendence, a few years ago, in Dumfriesshire, for what is considered in that agricultural county a small farm. The farmery is complete of its kind; but the house wants pantries and closets; and the pigsties are nearer to it than would be approved of in England. No poultry-house is shown; but hens are probably kept over the calf-house. It is remarkable that such an establishment should be considered complete with only two small bed-rooms. On the whole, the horses and cattle are much better provided for than the human beings. Extent without comfort is too frequently the characteristic of modern Scotch farmeries.

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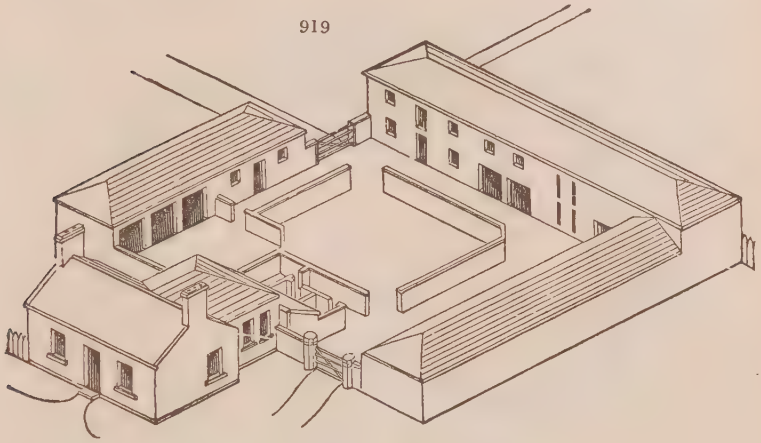

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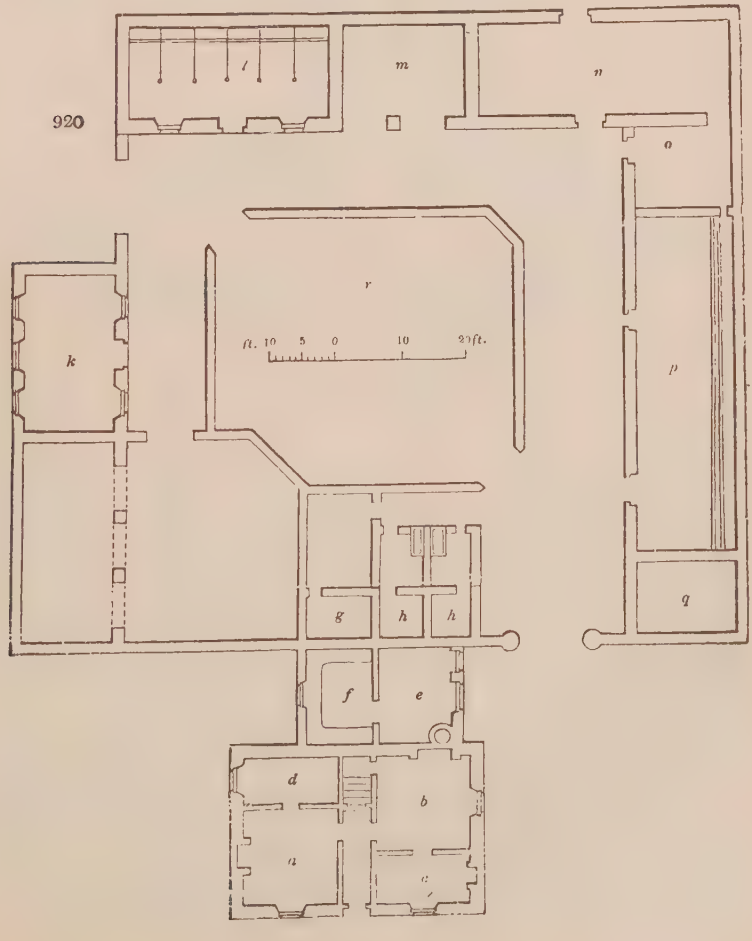

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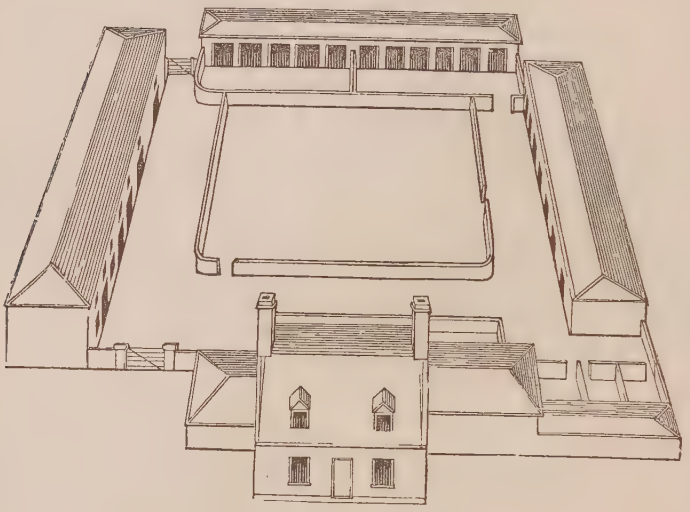

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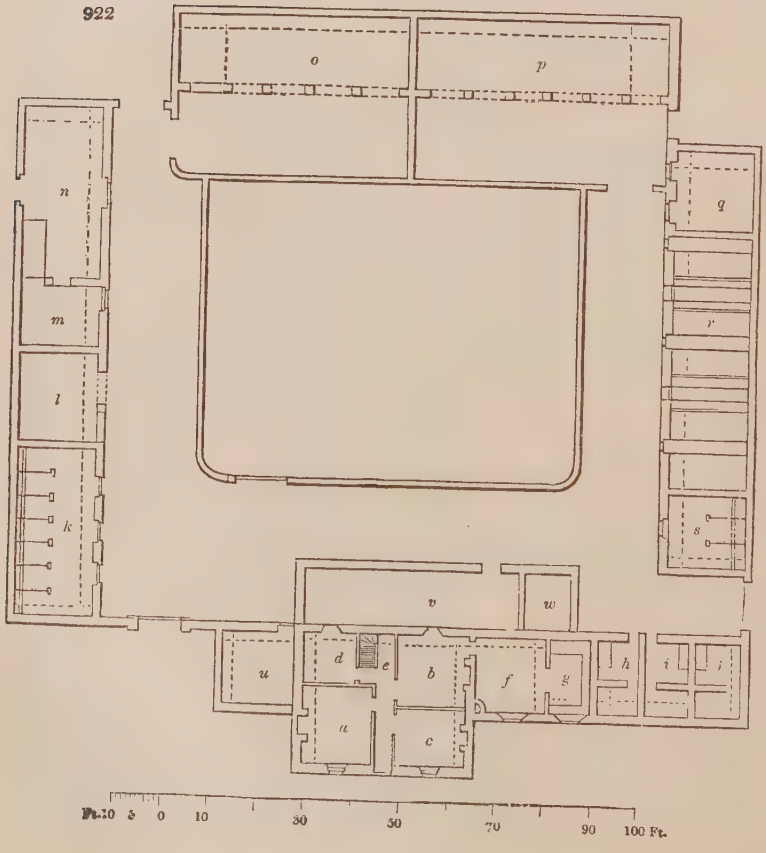

Design VIII. — *A Farm House and Farmery for three Ploughs, erected at Alton in Dumfriesshire.*

896. *Accommodation.* The general appearance is shown in fig. 921, and the ground plan in fig. 922. The ground plan of the house shows a parlour, *a*; kitchen, *b*; bed room, *c*; smaller bed-room, *d*; lobby and stair to garrets, *e*; scullery, *f*; and dairy, *g*. The farmery contains a house for store pigs, *h*; two houses for fattening pigs, *i*; stable for seven horses, *k*; cart-house, *l*; straw-house, *m*; barn with threshing-machine, *n*; cattle-shed with court, *o*; another cattle-shed, also with court, *p*; calf-house, *q*; byre or cow-house for twenty cows, *r*; spare stable, *s*; dung-pit, *t*; potato-house, *u*; kitchen court, *v*; and cleaning-shed, *w*.

897. *Remarks.* There is something like comfort in this dwelling-house, though a pantry is wanting, as well as certain conveniences in the kitchen court. In the small farm-houses, in Scotland, the dairy is commonly used as a pantry, to the injury of the milk and butter, as well as of the meat and bread. In making these remarks on the want of comfort and accommodation in Scotch farm-houses and farmeries, we hope it will not be for a moment imagined that we consider the fault in any degree owing to the Architect: the evil is much deeper seated, and belongs essentially to the state of civilisation. The Scotch farmers are not yet sufficiently free and independent to assert their rights to those comforts and enjoyments which belong to men with equal capital, intelligence, and responsibility, in almost every other country.

Design IX. — *A Farm House and Farmery for a small Farm for breeding Sheep and Cattle, erected at Holecleugh in Dumfriesshire.*

898. *Accommodation.* The general appearance is seen in fig. 923, and the ground plan

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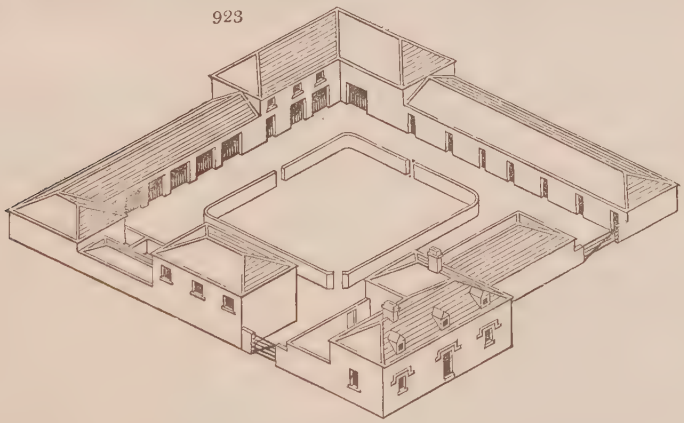
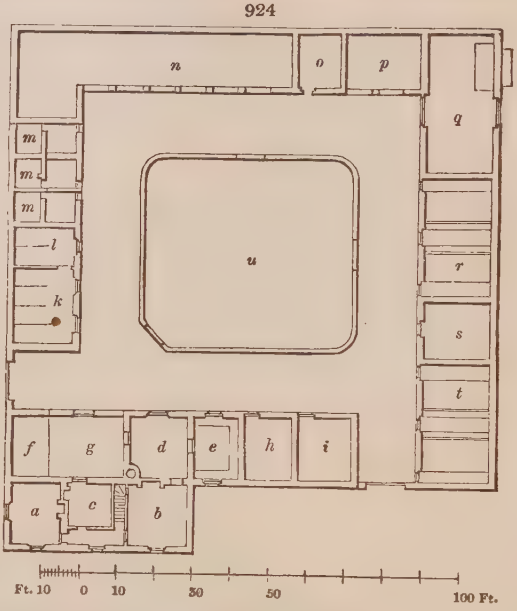


in fig. 924. The latter shows, in the farm-house, a parlour, *a*; kitchen, *b*; bed-room, *c*; scullery, *d*; dairy, *e*; cleaning-shed, *f*; kitchen court, *g*; potato-house, *h*; green-meat house, *i*; stable for four horses, *k*; stable for two horses, *l*; three pigsties, *m*; cattle-shed, *n*; green-food house, *o*; cart-house, *p*; barn, with threshing-machine driven by water, *q*; cow-house for eight cows, *r*; calf-house, *s*; cow-house for eight cows, *t*; and dung-pit, *u*. Fig. 925 shows a plan of the roofing of the farmery, and the four garret bed-rooms of the house.

899. *Remarks.* This is a compact and yet commodious farmery, and the house is not altogether without comfort, considering that there are a kitchen-court and a shed. In the cart-house, *p*, of this Design, and in the cart-house of preceding Designs, by the same most intelligent and experienced Architect, it will be observed that there is a space at one side, which, considering that the carts must be set back in a direct line with the openings between the piers, must be left empty. This space is purposely provided for harrows, ploughs, and other implements. It will be observed in this plan, as in most others, that there is generally a granary over the cart-shed; and that the barn is two stories high. Some descriptions of implements, and also boards and other bulky articles, are generally kept under the roof of the cattle-sheds, being laid across the tie-beams. These beams, or the beams of the cow-house, also form the roosting-place of the hens, where there is no poultry-house; and the ducks or geese, when there are any, take shelter where they can. In Scotland, this description of stock is despised by the large farmer as an article of profit, and not prized as an article of table

comfort. For this Design, and all our others from Dumfriesshire, we are indebted to Mr. Newall: as they have been, for the most part, erected on the property of one of the most wealthy men, and extensive landowners in Britain, the Duke of Buccleugh, they may fairly be considered as specimens of the best erections of the kind in Scotland. As we examined several of them, when in the west of Scotland in the summer of 1831, we can vouch for their substantialness, and we have no fault to find with their arrangement. The accommodation afforded, however, is, we think, less complete than it might be; there is no liquid manure tank, and no proper provision made for making the most of the waste waters, and other matters suitable for manure, produced in the dwelling-house. The dwelling-houses also want conveniences both for cleanliness and decency. That the absence of all these things, and of good gardens and orchards is entirely owing to the want of taste for them in the tenants, we had a decided proof in that part of the country; having stopped a day and night at the house of one of the Duke of Buccleugh's tenants, who, being engaged in commercial pursuits, and having consequently mixed much with society, knew what comfort was. At this gentleman's house we found not only a liquid manure tank, and a complete system of underground drainage to it, but every other rural comfort, and even luxury, both in the house, farmery, and gardens, that we could wish. The place we allude to is Woodhouselees, between Longtown and Langholme. That the Architect is not responsible for either the deficiencies in the farmeries, or in the dwelling-houses, is rendered certain by the villas which he has erected in various situations in the neighbourhood of Dumfries, containing every comfort, and modern refinement in convenience and arrangement, and at the same time displaying a high degree of architectural taste. Mr. Newall, indeed, has had and profited by every advantage that an architect can have, not only in Britain, but in France and Italy. This will be rendered obvious by some of his designs for villas, which will be given in the succeeding Book of this work.

924



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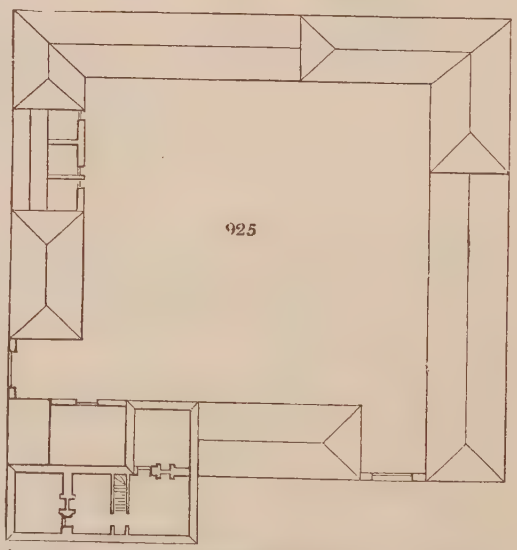

Design X. — *A Farm House and Farmery for a Farm of two Ploughs, erected on the Grebten Estate in Dumfriesshire.*

900. *Accommodation.* The general appearance is shown in fig. 926, and the ground plan in fig. 927. In the latter the dwelling-house exhibits a parlour, *a*; three bed-

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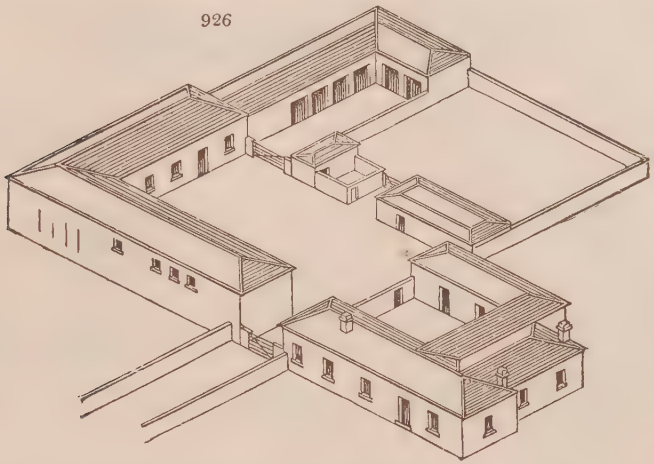

rooms, *b*; store-room, *c*; kitchen, *d*; scullery, *e*; dairy, *f*; coal-house, *g*; wood-house, *h*; potato-house, *i*, and kitchen court, *k*. The farmery shows a stable for a loose horse, or a mare and foal, *l*; a four-stalled stable, *m*; cart-house, *n*; barn, *o*; straw-house, *p*;

927

cow-house for five cows, *q*; calf-house, *r*; cattle-shed, *s*; cattle-court, *t*; hammel for a loose cow, *u*; pigsties for fattening pigs, *v*; sties for store pigs, *w*; dung-pit, *x*; garden, *y*; road to the farmery, *z*; and rick-yard, *&*. Fig. 928, is the front elevation,

928

by which it appears that the house is only one story high; and fig. 929 is the north-west elevation, in which, at *a*, may be seen the four vertical slits, two or three inches

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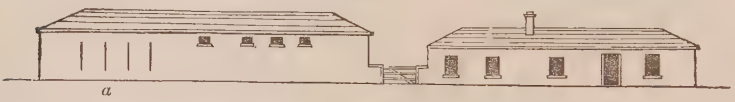

wide on the outside, splayed to one foot within, in the barn walls, for the admission of air and light: these slits are never above three inches wide on the external surface of the wall, but on the inside are spread out as much as a foot or eighteen inches, to promote a free circulation.

901. *Remarks.* This is a compact Design, and the house, with its kitchen court, is more than usually commodious for one of the smallest size: as in most of the others, however, privies are wanting.

Design XI. — *A Farm House and Farmery, for four Ploughs, designed, and in part executed, in Dumfriesshire.*

902. *Accommodation.* The general appearance is shown in fig. 930; and the ground plan in fig. 931. In the latter, the house exhibits an entrance-hall, *a*; lobby and stair-

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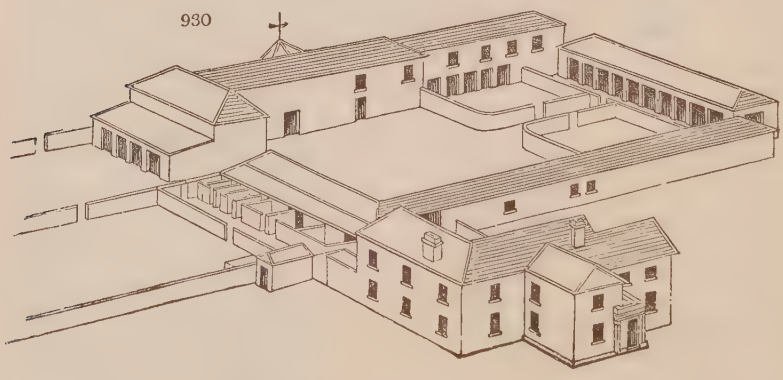
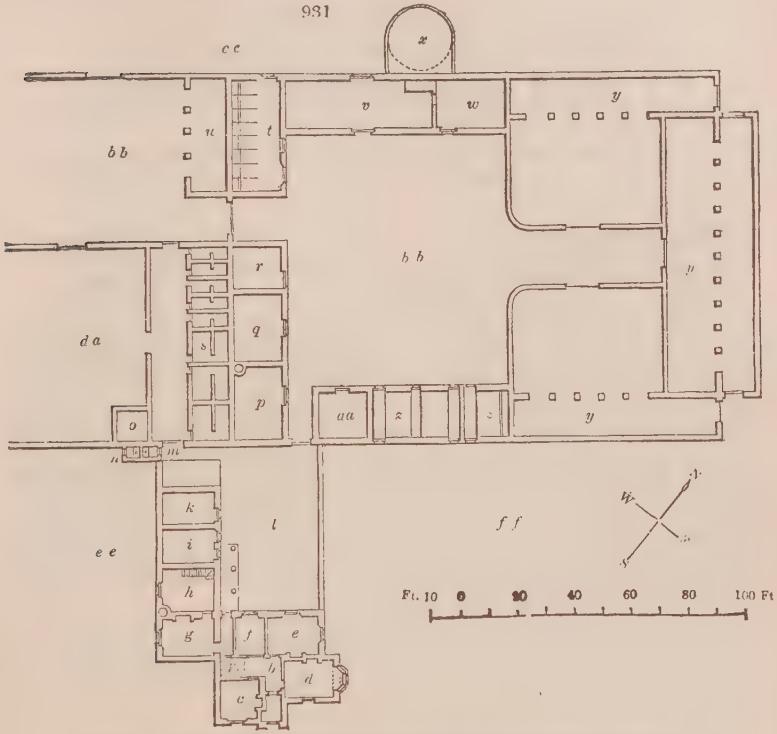


case, *b*; dining-room, *c*; drawing-room, *d*; library and office, *e*; store-room and pantry, *f*; kitchen, *g*; scullery, *h*; dairy, *i*, from which there is a veranda or covered way to the kitchen door; coal-house, *k*; kitchen court, *l*; servants' privy, *m*; best privy, *n*; ash-pit, *o*; steaming-house, *p*; feeding-house for cattle, *q*; loose stable, *r*; pigsties, *s*; stable for eight horses, *t*; cart-house, *u*; barn, *v*; straw-house, *w*; horse-walk for threshing-machine, *x*; cattle-sheds and courts *y*; cow-houses, *z*; potato-house, *aa*; open courts, *bb*; rick-yard, *cc*; dung-court, *dd*; pleasure-ground, *ee*; and kitchen-garden, *ff*. Fig. 932 is a plan of the second floor of the house, and of that part of the farmery which is carried up two stories high. In the house there appear four good bed-rooms, *a*; a closet, *b*; and three servants' rooms, *c*. The farmery exhibits a hay-loft over the stables, *d*; a continuation of the barn, *e*; a granary over the straw-house, *f*; and another granary over the cattle-shed, *g*. Fig. 933 is a front elevation of the house, with the south-east side of the farmery; and fig. 934 is an elevation of the north-east side of the farmery and of the farm house.

903. *Remarks.* The house is commodious, and the covered way from the kitchen to

931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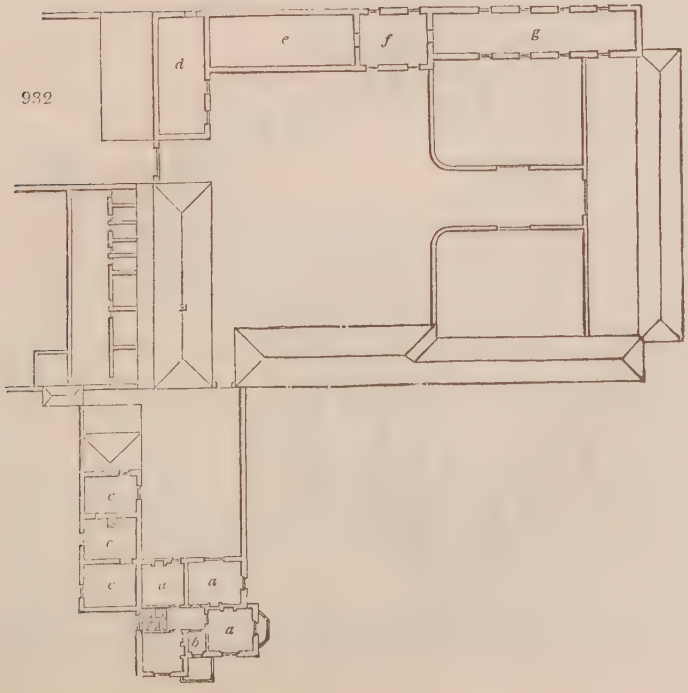
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the dairy, gives an idea that something is known about comfort, as the two privies do respecting cleanliness and decency. It is possible that one may walk about this farmery

934

without being shocked on turning every corner; but even in this respect it is not complete, as there should have been a third for the men-servants. It will be observed that the stable and cart-house, and the piggeries, and the three houses, *p*, *q*, *r*, are double buildings, use being made of both sides of the middle wall. This is always desirable when it is compatible with other arrangements, because not only a wall is saved, but guttering; and both buildings are kept warmer in winter and cooler in summer. On comparing this farmery with the most improved mode of arranging farmeries in Northumberland, the cattle-sheds and courts appear to us too large; it being found there that not only feeding-cattle, but even store beasts, always do better when three or four, or at most six, are together, than when a greater number are put into the same yard. Judging from the length of rack in the three cattle-sheds, *y*, one of them is calculated for two dozen, and the others for a dozen and a half each. There are no poultry-houses shown in the Design before us; and we are surprised that the kitchen-garden is not surrounded by a wall, which it always is in Northumberland.

Design XII.— *The Villa Residence and Farmery of Riddenwood, in the Parish of Kirkmahoe, Dumfriesshire, in the Occupation of the Proprietor, James Kerr, Esq.*

904. *Accommodation.* The general appearance is shown in fig. 935, and the ground

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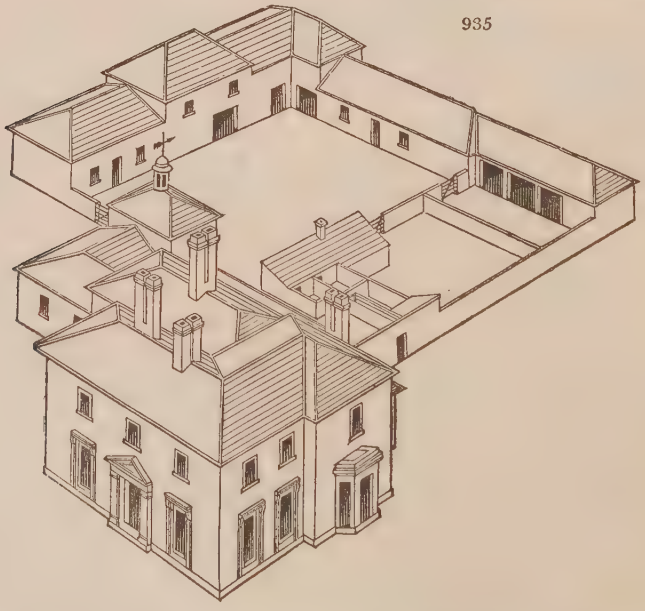

plan in fig. 936. In the latter, the house contains an entrance-hall, *a*; lobby, *b*; parlour, *c*; dining-room, *d*; drawing-room, *e*; closet, *f*; kitchen, *g*; store-room, *h*;

scullery, *i*; dairy, *k*; coal-house, *l*; gig-house, with poultry-house and dovecot over, *m*; kitchen court, *n*; ash-pit, *o*; servants' privy, *p*; best privy, *q*; pig-houses, *r*; steaming-house, *s*; dung-pit, *t*; cattle-shed and court, *u*; cattle-house, *v*; cow-house, *w*; green-food house, *x*; barn, *y*; cart-house, *z*; hay-house, *a'*; stable for five horses, *b'*; stack-yard, *c'*; kitchen-garden, *d'*; back entrance to the farm-yard, *e'*; plantation, *f'*; lawn varied with groups of shrubs and flowers, *g'*; and the approach-road to the house, *h'*. Fig. 937 is a plan of the second floor of the house, and of such parts of the offices as are carried two stories high; in which *a a a a* are four good bed-rooms; *b b b*, three large closets; *c*, the servants' room; *d*, turkey-house; *e*, hen-house; and *f*, granary.

905. *Construction.* The walls, like those of almost all the buildings in Dumfriesshire, are of reddish sandstone, and the roofs of blue slate. Fig. 938 is an elevation of the south or entrance front; fig. 939, an elevation of the east front; fig. 940, an elevation of the north side of the house, and kitchen offices, from the farm-yard; fig. 941, a general elevation, from the west side. The racks and mangers of the stables in this Design are somewhat differently constructed from those in general use. Each stall is five feet wide, one corner of which to the extent of two feet is occupied by a manger two feet square, and one foot deep; and the remaining three feet by a deeper manger of the same width, which reaches to within one foot of the floor, and in which the clover,

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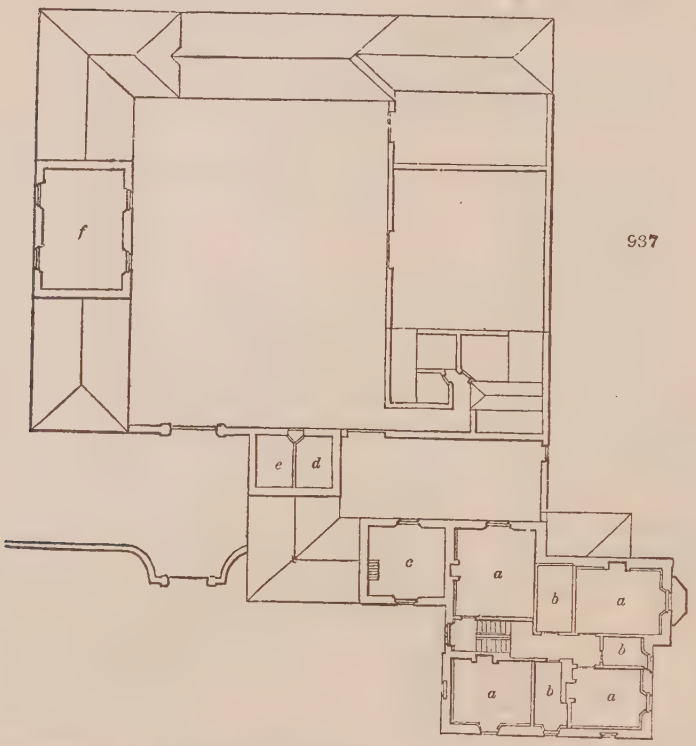

tares, potatoes, and other succulent food given to horses, are placed. Above, at the usual height, and on the old plan, is placed a common hay-rack, projecting from the wall. Fig. 944 shows a plan of this corn and fodder manger, in which *a* is the corn-manger; *b*, the fodder-manger; and *c*, a rail across it, to prevent the horses from tossing out the fodder, chaff, &c. Fig. 943 is an elevation of the same manger, in which *d* is the corn-

938

manger; *e*, the fodder-manger; *f*, the partition rail; and *g*, the hay-rack. Fig. 942 is a section in which *h* is the corn-manger; *i*, the fodder-manger; *k*, the partition rail; and *l*, the rack.

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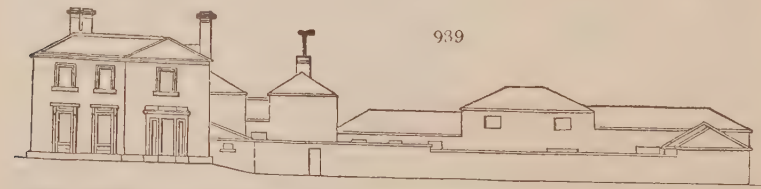

906. *Remarks.* This Design, by Mr. Newall, presents a handsome and commodious country residence; and one, judging from appearances, very suitable to what is called a gentleman farmer. It is a favourable circumstance for the effect of the house, that the

ground on which it stands is somewhat above the level of that of the farmery. The piggeries are very conveniently placed, with reference to the scullery and dairy; but unless

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they are kept very clean and sweet during summer, being so near the living-rooms, their smell will be offensive; we may say the same of the dunghill, which we should have

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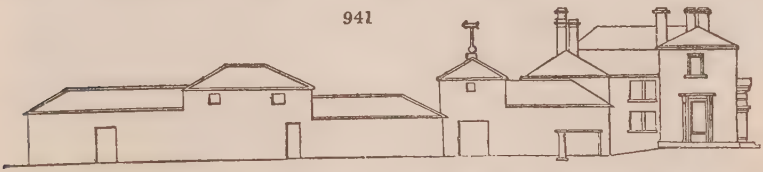

preferred in the situation of the cattle-shed, unless, indeed it be roofed over; a refinement, however, which we suppose is not yet introduced into Dumfriesshire. The foddering-

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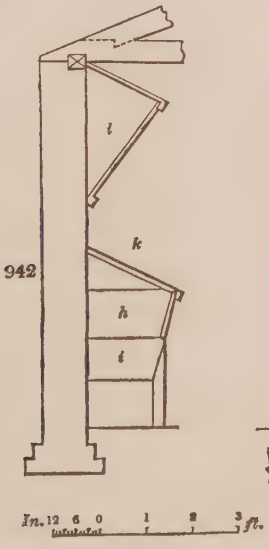

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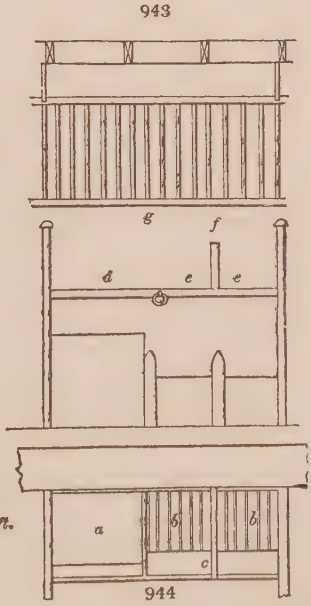

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manger we consider a good idea, and worthy of imitation; indeed, we believe it is now frequently to be met with in the south of Scotland and the north of England. When the cheapest and best mode of feeding horses and cattle is better understood, all the hay and straw given to them will be cut, by machinery, into short lengths; then mixed with corn, or with roots, or other succulent food, and water, and flavoured with salt; and probably, in the case of fattening cattle and sheep for the butcher, with the addition of highly aromatic herbs, to give a flavour to the meat. *Melilòtus officinàlis* will one day be as important a plant to the British farmer as it now is to the farmer of Switzerland.

907. *Specification for Dumfriesshire Farmeries.* The following detailed particulars of

the mode of building farm houses and farmeries, such as we have given above, has been furnished us by Mr Newall: —

Specification of the Materials and Works required to build a Dwelling-house, and a Steading of Farm Office Houses at *agreeable to given Plans for*

908. *Digger and Leveller.* The whole of the surface mould is to be stripped from the site of the buildings, the dung and court yards, and to the extent of 2 feet beyond the respective outside walls of the buildings, and it is to be laid into the proposed garden. The site for the buildings is to be properly levelled, agreeably to the sections and plans; and these levels are to be taken from the level of the principal floor of the dwelling-house, which is marked by a post fixed into the ground at the south corner of its site. The cellars under the parlour are to be sunk to the depth of at least 9 feet 6 inches below the level of the principal floor of the house. If it be found, after these levellings and excavations are made, that there are any soft parts in the ground along the lines of the foundations, trenches are to be cut through these parts for the footings of the walls, to a sufficient depth to insure a proper foundation. All the earth, rubbish, &c., of these excavations and levellings, together with all the rubbish that will accumulate during the building and finishing of the houses, are to be removed to such place or places as shall be fixed upon before entering into contract.

909. *Dwelling-House.—Mason's Work. Foundations.* The foundations of the thick walls are to be laid with large suitable flat-bedded stones (stones level on the under surface), which are to be at least 6 inches thick, and so broad as to leave offsets on each side of the respective walls, as shown by the sections of the footings.

910. *External Walls.* The walls of the front and gables are to be built with coursed rubblework (courses of unequal height, but of hammer-dressed stones), neatly dressed, and closely jointed; all the other external walls are to be of good rubble building, neatly dressed; and the inside thick ones to be likewise of good rubble building. All these walls are to be properly built in the heart (in the centre or middle of the walls) with good lime mortar; and they are to have such a proportion of in-bonds (bond stones stretching across the wall) throughout the whole of them, that these shall not be more than 4 feet apart in any direction on either side of the walls: these in-bonds are not to be less than 18 inches in length, and 16 inches into the wall; but they are not to be more than 9 inches in height.

911. *Hewn Works.* The whole of the window rybets (reveals), sills, and lintels; the entablatures over the windows, and all the other dressings round the front and gables; the portico and doors, ingoings (jambs or sides), and stair of the front entrance-door; the wall head cornice and gutter, with a 6-inch course under the cornice, are to be of neatly polished freestonework; and all the entablatures, cornices, and other dressings, are to be cut to the respective drawings. All the other door and window rybets, sills, and lintels; the wall head tabling of the low buildings; the chimney tops (or stacks), and the external corners, and base course, are to be of droved (a particular mode of hewing with a broad chisel, called a drove by masons, which leaves its marks, not unlike the squares on a chess-board, but smaller) freestonework.

912. *Chimney-pieces, Hearth, &c.* The chimney jambs and hearth are to be of fine polished freestonework, and those of the two parlours are to be cut to imitate marble ones, as shown by the drawings. The chimney flues are to be built oval, and neatly plastered. The hearths of the first (ground) floor are to be laid in mortar over a mass of dry whinstones (granite, or any local stone, not freestone), enclosed with rubble building.

913. *Stairs.* The stairs are to be of polished freestonework; and the fronts of the steps, &c., to have torus and fillet mouldings; and the whole to be finished with polished stone skirting.

914. *Stone Floors.* The floors of the entrance-lobby and passages are to be laid with fine polished pavement, at least 2 inches and a half thick. Those of the kitchen and scullery are to be laid with the hardest pavement that can be procured in the quarry; and the flags are to be at least 3 inches and a quarter thick. Those of the dairy and cellars are to be laid with good droved pavement; the flags to be 2 inches and three quarters thick. They are all to be square-jointed at least 2 inches from the face, and set with lead and oil putty to a similar breadth. Preparatory to laying these floors, all the earth, rubbish, &c., is to be cleared from the respective apartments, to the depth of at least 18 inches below the level of the floors; and these spaces are to be filled with clean small whinstones to the depth of 12 inches, over the top of which a stratum of lime riddlings (or any such mixture) is to be put, so compact that the sand (or mortar) in which the flags are laid will not pass through it. All these stone floors are to be finished round with polished stone skirting, at least 5 inches high.

915. *Stone Tables.* The dairy is to have polished stone tables (or shelves) round it, as shown by the plans, and they are to have polished stone skirting along the top of them, at least 6 inches high.

916. *Catacombs, or Bins.* The spirit cellar is to have two tiers of catacombs (bins) along the side of it, with divisions over the second tier to form a third tier. These catacombs are all to be of plain droved work.

917. *Partitions.* The thin partition walls are to be constructed with hard-burnt bricks.

918. *Dwarf Walls.* Dwarf walls, 12 inches thick, are to be constructed to support the sleepers of the floors of the two parlours, bed-rooms, &c., on the ground (or first) floor. Stones of droved work, 8 inches thick, are to be built into the high walls, along the lines of the roofs of the low buildings that join the high ones, for the purpose of inserting lead aprons to cover the joinings of the slates, &c., with the high walls. All the rubble and brick buildings are to be built with strong well prepared lime mortar; and all the hewn works are to be set with lead and oil putty.

919. *Carpenter's Work. Inside Lintels.* The inside lintels of the door and window spaces are to be of British oak, free from sapwood: they are to be not less than 6 inches square, and to have at least 12 inches of bond (or wall-hold) on each end.

920. *Roofs.* The roofs are to be constructed as shown by the plans; and the scantlings of the timber are to be of the sizes figured thereon; the small couples (couples of the narrow houses) and half couples (hip and valley rafters) are to be placed at no greater distance from each other than 16 inches between their centres. The diagonal and alley beams are to be 9 inches by 2 inches. The slate laths are to be sawn ones, 1 inch and a half by five eighths of an inch.

921. *Joists.* The joists and sleepers of the principal part of the house are to be of Memel timber; those of the chamber floor are to be 10 inches deep, and 2 inches thick; and they are not to be more than 14 inches apart; they are to have two tiers of bracing (strutts, nailed diagonally between the joists, to keep them firm) to the floor of each room, which bracing is to be 9 inches deep by 1 inch and a quarter thick. The sleepers are to be 5 inches deep, and 2 inches thick; they are to be supported by the dwarf walls formerly specified, and they are not to be more than 14 inches apart. The joists over the kitchen, scullery, &c., are to be 9 inches by 2 inches, and placed 14 inches apart; they are to have two tiers of bracing, similar to those specified for the other floor.

922. *Flooring.* The flooring is to be at least 1 inch and an eighth thick when finished, and none of the boards are to exceed 6 inches in breadth; they are all to be feathered and grooved, and nailed through the feather edge, and the wood employed is to be perfectly sound and seasoned.

923. *Partitions.* Those partitions in the chamber floor that are to be constructed with timber, are to have the stiles 4 inches by 1 inch and a half, and placed at no greater distance from each other than 12 inches between their centres: they are to be properly braced.

924. *Doorcases.* The doorcases (or jambs) are to be constructed with timber 2 inches thick, but their breadth must be regulated by the thickness of the respective walls into which they are placed; and their size is shown by the plans.

925. *Stoothing* (quartering). The whole of the insides of the external walls are to be properly stoothed (battened); the wall-straps (battens, or pieces of quartering on which to nail the laths) are to be 1 inch and a quarter thick, by seven eighths of an inch, and placed at no greater distance from each other than 12 inches between their centres; the wall docks (plugs of wood) are not to be more than 16 inches apart. N. B. If whinstones are to be employed in building the inside walls, and the insides of the external ones, bond timber must be used; and large blocks of timber must be built into proper situations to receive the bell wires, &c.

926. *Doors.* The framings and mouldings, &c., of the doors are all to correspond in size with their respective sections; those of the first or ground floor are to be hung with 5-inch double-jointed hinges, and those of the chamber story are to be hung with $4\frac{1}{2}$-inch double-jointed hinges. The locks of the principal rooms are to be 7-inch mortise ones, value each 10*s.* 6*d.* The entrance-door to have one, value 15*s.* All the other doors are to have each a rim lock, value 6*s.* The spirit-cellar lock is to have a copper bolt, and its value is to be 8*s.* All the press doors are to have suitable press locks, value each 3*s.* 6*d.*

927. *Windows.* The windows, including the skylights, are to be good astragal (the bars with astragal mouldings) ones; the sash frames of those of the first floor are to be $2\frac{1}{8}$ inches thick; the frames of all the others are to be 2 inches thick. They are all to be glazed with second crown glass, and to be finished with three coats of lead and oil paint. They are all to be double hung (each sash is to be hung) with axle pulleys, and best window line. The skylights to be hung on the upper parts, ends with pivot hinges, and each to have a hinged rack for holding them up or down.

928. *Window Shutters.* All the windows are to have framed shutters; the framings and mouldings to correspond with their respective sections. Those in the principal rooms of the first floor are to have framed back-laps (parts of the shutter that fold behind the part seen) to correspond with the shutters. The shutters are to be hung with 3-inch hinges, and the back-laps with $1\frac{1}{4}$ inch back-lap hinges.

929. *Soffits, Ingoings, Scuncheon Linings, &c.* All the windows of the principal rooms of the first story, and those of the chamber story, are to have framed soffits and ingoings to correspond with the shutters. Those of the other parts of the house are to be plain. The scuncheons (the beveled parts, splays, or elbows, of the inside of a window opening, where the shutters are placed) of the two parlour windows are to have framed linings to correspond with the shutters; all the other windows are to have plain linings, and those of the low buildings are to have plain soffits and ingoings.

930. *Architraves, Facings, &c.* The doors and windows of the two parlours are to be finished with double-faced architraves, and all the other doors and windows are to be finished round with moulded facings; they and the architraves are to be made to correspond with their respective sections. The skylights are to be finished with suitable linings and facings.

931. *Bases.* The two parlours are to be finished with bases to correspond with their other finishing, the plinths of which are to be 6 inches and a half high. All the other apartments, passages, &c., that are floored with timber, are to have skirtings to correspond with the facings of the respective apartments, &c. Those of the first and chamber floors are to be 6 inches and half high; and those of the kitchen buildings are to be 5 inches and a half high. The parlours are each to have a surbase to correspond with the base; and the window architraves and facings, the bases and skirtings, and the surbases, are all to have suitable grounds. Those of the windows are to be dressed; and those of the thin walls are to be built into them.

932. *Jamb Moulding.* The chimney jambs, that are not made in imitation of marble ones, are to have jamb mouldings round them, and light entablatures over them.

933. *Stair of Kitchen Buildings.* The stair to the apartments over the kitchen, scullery, &c., is to be of timber; the steps are to be 1 inch and an eighth thick; it is to have a suitable plain rail. The stair to the chamber floor is to have a suitable hand-rail of wainscot, fixed upon plain iron balusters, three fourths of an inch square, which are to be batted (run with lead into holes chiseled out for their reception) into the steps, &c.

934. *Press Shelving.* All the presses are to have tiers of shelving; and the store closet is to be fitted round with three tiers of shelving; each tier to be 14 inches broad.

935. *Slating.* The roofs are to be covered with best second Lancashire ton slates (or others according to local situation), hung to the laths with Memel timber pins, and to be rendered (pointed inside) with good plaster. The slates are to have at least 3 inches of bond at the eaves; but the bond may gradually diminish to 2 inches at the ridges. The ridges and piens (angles of the hips) are to be slated watertight before they are covered with the lead. The ridge and pien batten rods (ridge and hip rods) are to be 2 inches' diameter, and they are to be covered with lead, 6 pounds to the square foot, which is to be at least 12 inches in breadth. The alleys are to be laid with lead, 7 pounds to the square foot, which is to be at least 14 inches in breadth. All round the chimney stalks (shafts), where they are intersected with the slates, coverings of lead, 12 inches broad, are to be inserted into the chimney heads, to cover the joinings, and these coverings are to be of lead, 6 pounds per square foot. All along the lines of the roofs that intersect the higher buildings, the joinings of the slates with the walls are to be covered with aprons (or flashings) of 6-pound lead at least 12 inches broad. The skylights are to be laid round with gutters of 6-pound lead, at least 12 inches broad. The aprons round the chimney stalks, and those that cover the joinings of the low roofs, are to be inserted into mortises or grooves, made in the stones as formerly specified; and they are to be puttied into these mortises with lead and oil putty, mixed with fine sand, or dry pounded sandstone, well burnt (or roasted). This roasting is to destroy all earthy matter, &c.

936. *Plasterers' Work.* The ceilings of all the apartments, passages, &c. of the first and chamber floors, and the walls of the entrance-lobby, passages, and staircase, are to be finished with good three-coat plaster. That of the ceilings to be on laths three sixteenths of an inch thick; and each apartment to have a suitable cornice, finished agreeably to the sections. All the ceilings of the kitchen buildings, and of all the other walls not specified above, are to be finished with fine two-coat plasterwork, to be properly straighted (made even or smooth with the edge of a board or float), &c. Behind all the ingoings, soffits, bases, and skirtings, &c., the wall is to have one coat of plaster, without finishing.

937. Though a variety of the materials and works are described in the foregoing specifications, yet it is not to be considered that the whole are specified, but it is to be distinctly understood that the whole are to be included in the estimate; so that the house may be built and finished with materials and works of the quality and relative scantlings with those specified and figured on the plans, without any other charge than that in the estimate; and the whole of the materials and works are to be done to the satisfaction of by the day of , under a penalty of £ .

938. *Office Houses. — Rubble Walls.* The foundations of the thick walls are to be laid with large flat-bedded rubble-stones, and the whole of the walls are to be good rubble-work, properly built in the heart with good lime mortar; and such a proportion of large bond stones to be used throughout the whole of them, that they shall not be more than four feet apart, in any direction, on either side of the walls.

939. *Hewn Work, &c.* The door and window rybets, sills, and lintels are to be of droved freestonework; they are all to have canted corners (the sharp angle of the corner cut off). The scuncheons of the doors are to be splayed 4 inches wider inside than at the rybet cheeks (see § 282, and fig. 262), and their inner corners are all to be rounded. In-bond rybets with 12-inch heads are to be built at proper heights for fixing the crooks of the door hinges. The lintels are to be at least 12 inches square. The window sills are to be weathered (beveled so as to throw off the rain) at least 2 inches, exclusive of a sinking for the wood sills, as shown by the sections. All the external corners are to be of droved work. The wall-head tablings (copings beveled to throw off the rain) are to be of droved work 3 inches thick, and to project 5 inches beyond the line of the walls. The door scuncheons and lintels of the cart-house and loose cattle sheds are to be neatly draughted and scappled (stones are said to scappled or scabbled, when they are dressed with the pick end of the hammer; they are called draughted and scappled when worked round the edges or joints with a chisel and hammer-dressed in the centre), and the corners canted with droved work. The pillars for the cattle are to be in one stone each, and to be finished in a similar manner with the scuncheons. The door scuncheons, sills, and lintels of the barn-ventilators, &c., are to be draughted and scappled.

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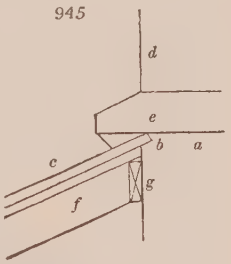

940. *Barge Stones over the Slates.* Droved stones 4 inches thick, weathered on the upper side, are to be built into the walls of the high buildings, along the lines of the roofs of the low ones that intersect them; these stones are to project at least 4 inches in front of the walls, to cover the ends of the slates, and to lie close upon them, fig. 945; and ragalets (grooves), 2 inches deep into the walls, are to be made under these stones, to receive the ends of the slates. In fig. 945, *a* is the wall, *b* the situation of the groove, in which the slate, *c*, is shown inserted; *d* is the upper part of the wall; *e*, the weathered stone inserted into it; *f*, the rafter; and *g*, the wall-plate.

941. *Floors.* The barn is to be floored with the hardest freestone pavement that can be procured in any particular quarry in the neighbourhood. The flags are to be square-jointed, and set with oil putty; and they are to be laid on a preparation of whinstones, similar to that specified for the floors in the dwelling-house. There is to be a 6-inch skirting built into the walls at the level of the floor, so that the flopring may be jointed to it with putty. This is to prevent the operations of vermin. The floors of the pig-houses are to be laid with rough flags closely jointed; and these floors are to have a current of at least 9 inches from the back walls towards the doors. The stables, byres, and all the other houses not specified above, are to be paved (pitched) with small whinstones set in sand, and all the requisite sewers are to be made in the cattle-sheds, stables, &c. The byre is to have a freestone kerb along the sides of the grip (gutter), the stones of which are to be 16 inches deep and 4 inches and a half thick, and placed so that they will stand 6 inches above the bottom of the grip, all as shown by the plans.

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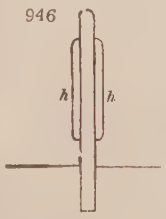


942. *Partitions of Byre.* The byre is to have stall partitions of freestone, each to be in one stone 4 feet 6 inches by 5 feet, which are to be sunk into the ground 1 foot, and on each side of these partitions there is to be an iron rod, with a sliding shackle (fig. 946 is a section across a stone partition, in which the iron rods at *h h* are the shackles) upon it, upon which the collar is fixed for binding the cow. The feeding-crib is fitted up with rough droved work, and the partition between it and the fotherum (foddering-passage) is to be of freestone flags set on end, and to stand at least 2 feet 6 inches high above the crib. All these are shown by the detailed plans and sections.

943. *Cope of Court Walls, &c.* The court walls of the pig-houses are to have a cope (coping) 6 inches thick, of draughted and scappled work; but the joints are to be droved and jointed with oil putty. The cope is to be laid even with the walls on both sides. The walls of the kitchen-court, large court, dung-court, &c., are to be covered with a 3-inch cope of droved work jointed with putty. The cope is to be laid even with the walls, on the sides next the large court and cattle-sheds; but it is to project 3 inches on the side next the kitchen court, 2 inches on the side next the dung-court, and 6 inches on the side next the garden.

944. *Stable Windows.* The stable windows are to be made ingoing ones (recessed from the inside), in order that corn-chests may be fitted into them. The upper sashes are to be astragal ones, glazed with third crown glass, and the under ones are to be sliding wooden frames, for ventilation, &c. The back wall of the barn is to be sunk sufficiently deep for the wheel of the threshing-mill and the race (horse-course) from it. The hewn work is all to be jointed with oil putty, and all the rubble-work is to be built with good lime mortar.

945. *Inside Lintels.* The inside lintels of the door and window spaces are to be of British oak timber; they are to be proportioned in size to the width of the respective spaces; and they are all to have 12 inches of bearing on each end (or bond).

946. *Roofs.* All the roofs are to be constructed, as shown by the plans, with trussed principals; which are all to be of the dimensions figured on the respective sections. These principal couples (rafters) are to be placed at no greater distance from each other than 6 feet 6 inches between their centres. The purlins are to be 7 inches by 3 inches and a half, and placed no farther asunder than 3 feet 6 inches. The rafters are to be 2 inches and a quarter square, and placed no farther asunder than 16 inches between their centres. All the roofs are to have sawn laths 1 inch and a quarter by five eighths of an inch each.

947. *Slating.* The whole of the roofs of these office-houses are to be covered with second Lancashire slates (or as the case may be), hung with Memel timber pins; and they are to be rendered with good plaster. They are to have 3 inches of bond at the eaves; but the bond may gradually diminish to 2 inches at the ridges. The under eave-courses are to be laid full, and they are to be double-nailed at the shoulders with 12-lb. nails. The ridges and piens are to be slated water-proof, before the pien and ridge-stones are laid over them. The gables are to be slated over, and the skew-stones (the coping-stones of the gables, called barge-stones in England) are to be laid over the slates, but to project 3 inches over the line of the walls, and to be pointed along the ends of the slates under them with Roman cement. The eaves slates are to project 4 inches beyond the line of the tabling. The ridge and pien stones are to be of fine droved work; they are to be made correctly to the angles of the respective roofs; to be closely jointed with oil putty; and, when perfectly dry, to be painted with three coats of oil paint, the same colour with the slates.

948. *Joists.* The joists of the granary floors are to be 12 inches by 2 inches and a quarter, and placed no farther asunder than 16 inches between their centres: they are to have a tier of bracing along the centre of each floor, 11 inches by 11 inches. Those of the stable lofts are to be 8 inches by 2 inches, and placed no farther asunder than 18 inches between their centres. The flooring is all to be 1 inch thick when finished, and none of the boards are to exceed 7 inches in breadth; they are all to be feathered and grooved. The granaries and haylofts are to be finished all round with skirting, not less than 5 inches high; the walls of the haylofts are to be plastered at least 9 inches above the skirting; and the walls of the granary are to be plastered at least 2 feet above the skirting.

949. *Doors.* The whole of the doors of the office-houses are to be stout batten ones. The front boards are not to be less than seven eighths of an inch thick, and the battens are not to exceed 6 inches in breadth; the back battens are to be 1 inch thick, those of the small door to be not less than 7 inches broad, and those of the large ones not less than 9 inches broad. These doors are all to be hung with stout crooks and bands. The doors of the stables, barn, byres, granaries, calf-house, potato-house, and coal-house are each to have stock-locks, value 4*s.* each; and the doors of the granaries and stables are to have likewise thumb latchets. All the other doors are to be secured with bolts, &c. All the hinges, &c., are to be proportioned in size to the size of the respective doors.

950. *Stables.* The stables are to be fitted up with stall partitions of 2-inch battens, fixed in oak posts 6 inches square, with canted corners; and they are to be fixed under beams 6 inches square, which are to extend the whole length of each stable, under the joists of the hayloft. The feeding (or hay) cribs of the stables are to be constructed like mangers; but they are to be about 18 inches deep and 18 inches wide at the top; and are to have two slanting iron bars rising from the front of them to the wall, at an angle of about 45°. The corn manger occupies about one third part of the width of the stall, and the feeding-crib the other two thirds (as shown by detailed drawings). The granary windows are to be sliding-framed ones, or they may be made with shades similar to Venetian ones, proper for ventilation, &c.

951. *Cattle-sheds.* The cattle-sheds to be fitted up with feeding-cribs, the bottoms of which are to be raised 9 inches above the level of the floors; they are to have 3 rails in front, fixed to the upright posts. The upper one is to be 4 inches by 3 inches, the middle one 3 inches by 1 inch and a half, and the under one 5 inches by 1 inch and a half. The bottom rails are to be 2 inches by 1 inch and a half, and placed no more than 1 inch and a half apart. The side next the fotherum is to be finished with 1-inch

battens to the height of 2 feet 6 inches. Fotherums are not always introduced in cattle-sheds (see the sections, &c.).

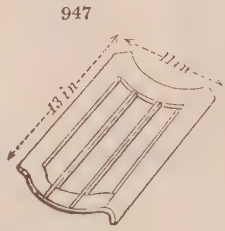
952. *Feeding-houses.* The feeding-houses are divided into stalls of 12 feet 6 inches each (either with stone or timber); and the hayracks are placed along the tops of these partitions, nearly in the form of two sides of an equilateral triangle, at the height of about 4 feet 6 inches from the floor. These racks extend from the feeding-cribs to the front of the covered part of the shed. The feeding-cribs are constructed similar to stable-mangers, but they are to be 18 inches wide and 10 inches deep, and are raised 9 to 12 inches above the level of the floor. The partition between the crib and the fotherum is to be of 1½-inch battens. These cribs may be of wood, or they may be constructed of similar materials to those of the byres. The byre partitions may be of timber, where stone cannot be procured.

953. *Gates.* The gates of the court-yards, &c., are all to be constructed as shown by the plans; and they are to be hung with stout crooks and bands (hooks and strap hinges). The gates, and all the outside doors, the stable and granary windows, are to be finished with three coats of oil paint.

Design XIII. — *A Farm House and Farmery for* 100 *Acres of Land to be cultivated on the Norfolk System, with a Flour Mill driven by Wind.*

954. *Accommodation.* The general appearance is shown in the isometrical view, p. 473. The ground plan, fig. 948, exhibits a dwelling-house, containing a parlour, 1; kitchen, 2; counting-house or keeping-room, 3; store-room, 4; pantry, 5; wash-house and brewhouse, 6; and dairy, 7. Over these are two large bed-rooms with fireplaces, and four other bed-rooms without fireplaces. The farmery contains a central building of two stories, in which, on the ground floor, are, a passage to the mill, which serves also as a foddering-passage, 8; a place for turnips, 9; for calves, 10; for four cows, 11, over which there are a granary, and a retail shop for flour, lighted by glazed tiles (fig. 947) of cast iron (weight four pounds and a quarter, price, unglazed, 8*d.*, glazed, 1*s.* 4*d.*) from the roof; a house for six oxen, 12; for chaff, 13; the mill, 14; the barn, 15; the cart-house stable, with hayloft over, 16; lean cattle lodge or shed, 17; the harness-room, 18; piggeries, 19; cart lodge, 20; drive-way to the mill, 21; hackney stable, with hayloft over, 22; customers' stable, 23; colt stable, 24; and gig-house, 25. There are two ample yards, 26 and 27, for the lean cattle and the colts; and two also, 28 and 29, for the piggeries.

947



955. *Remarks.* This plan has been furnished us by William Thorold, Esq., Architect and Engineer, of Norwich, accompanied by the following observations:—"The capital required to carry on a mill must necessarily limit the size of the farm. We will, therefore, take a farm of 100 acres of land, four fifths being arable, and the remainder in grass; and we will suppose the mill competent to grind thirty quarters of corn per week, twenty of which would be manufactured into flour and sold, and the remaining ten used as grist for the neighbourhood; the mill being supposed to be situated in a rural district. The mill should have a threshing-machine and hay-cutter attached to it; the threshing-machine to be made capable of drawing, that is, of husking, trefoil, clover, and other small seeds. Pumps can also be added in situations where water is at a great depth, which will often occur in places proper for a windmill. A number of pigs may be kept, to eat up the offal of the mill; and this will, of course, require buildings for their reception more extensive than the piggeries on a common farm, while the buildings for the other cattle are fewer in proportion. The mill is placed in the centre, for the sake of uniformity and economy. It is necessary to have one side of it accessible to waggons, and also in case of repairs being done to the sails. The piggeries I have placed on the north side; knowing, from experience, that they are intolerable in summer, if near the house. In constructing the mill, a horse walk should be added to it, in order that the machinery of the mill may be occasionally worked with that power. There is stabling for four farm horses, and for two hackney or trade horses, besides a loose stable for customers' horses: there is also a cow-house for four cows; stalls for six grazing bullocks; and a lodge for lean cattle. This will generally suffice for milling and farming as it is carried on in Norfolk. The house contains a parlour and kitchen, with a brewhouse and wash-house combined, on the ground floor; and it has six sleeping-rooms in the upper story. It is kept low, in order that it may offer as little obstruction as possible to the wind. The fireplaces for the kitchen and for the office or keeping-room are contrived so that the chimneys may be conducted under the stairs, and form one stack with the other chimneys. The parlour window is to have French casements, opening in the middle. The mill will cost from £800 to £1000, according to the quantity of machinery employed. The sails,

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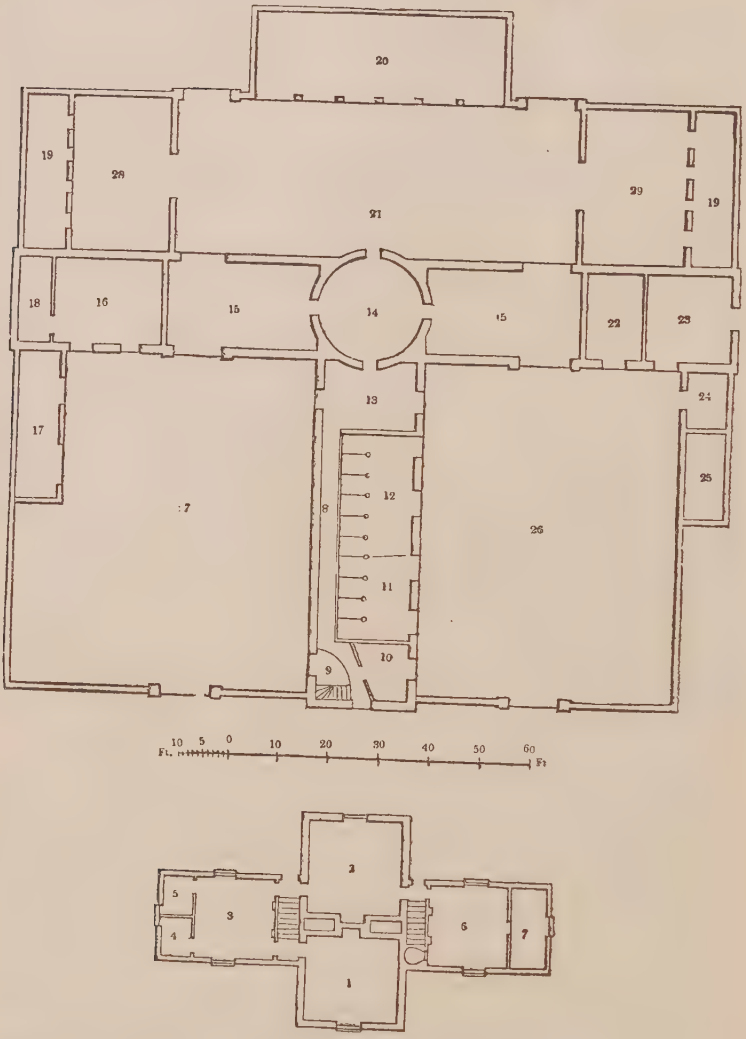
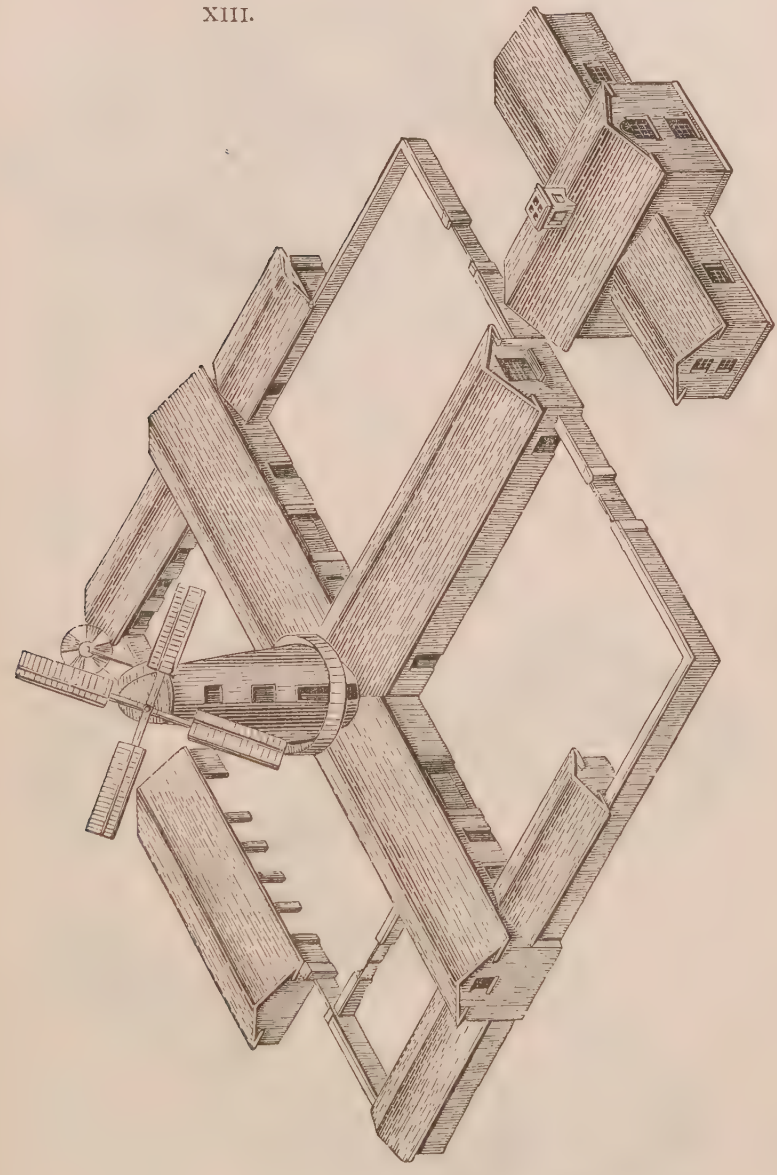


as shown in the Design, are upon the principle generally adopted in Norfolk, called Cubitt's Patent: they should never be horizontal, as such sails have only one fourth of the power of vertical ones. Norfolk is considered to be superior to any other county in England, as to windmills." We consider this a remarkably well arranged Design, which will not surprise those of our readers who are aware of the experience which Mr. Thorold has had as a farmer, as well as an Architect and Engineer. The entrance to the cattle-house, being near the dwelling-house, is convenient, on account of its supplying a covered passage to the mill-house and barn: and this passage is not merely a matter of convenience as such, but it is essential to the cattle-house for conveying fodder from the straw-house at one end, and turnips from the turnip-store at the other to the oxen. It is always gratifying when a really useful object or arrangement can be rendered at the same time ornamental or agreeable. The back cart or waggon entrance to the mill is exceedingly well contrived, while it serves at the same time as the waggon court, which could not have been dispensed with in a farmery of this extent when combined with a mill. The architecture of a building containing a windmill will be given in the next subsection.

XIII.



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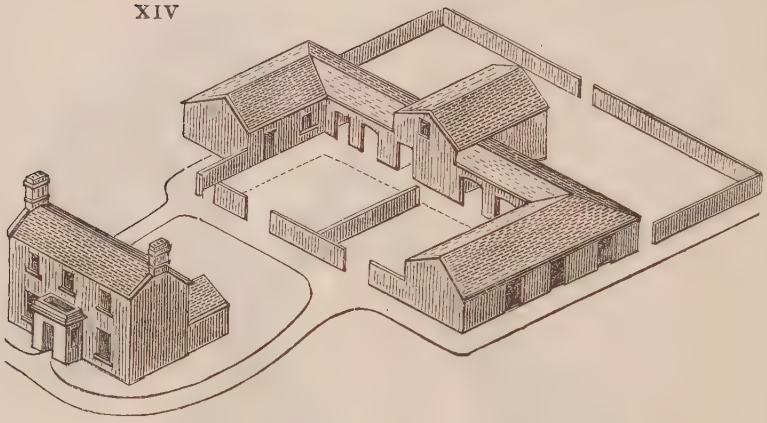

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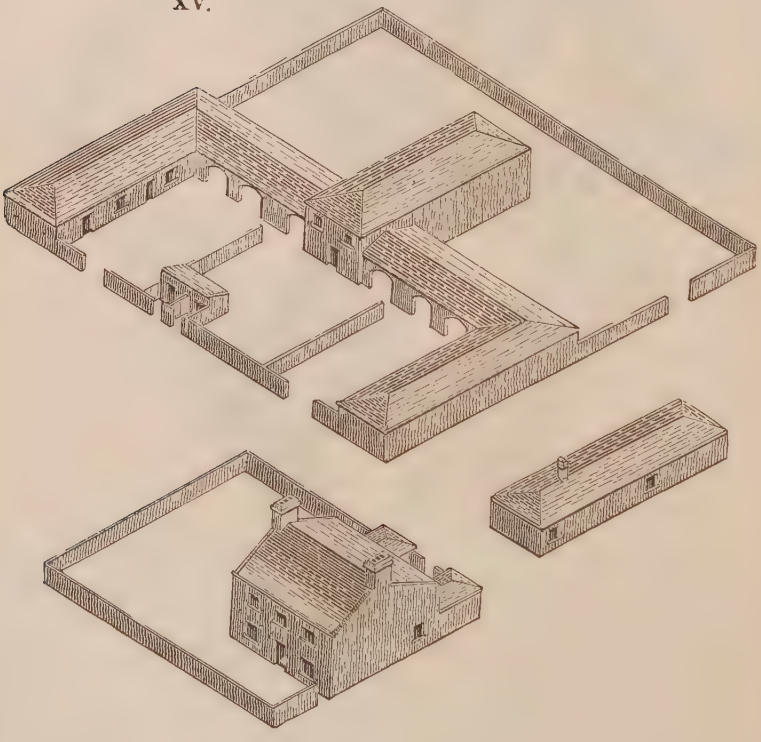
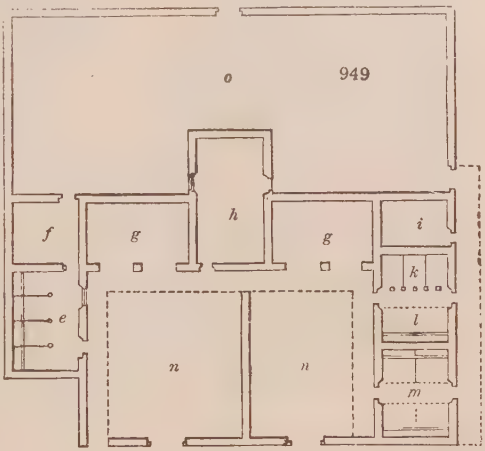
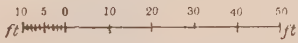
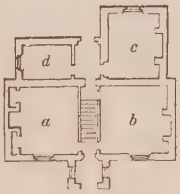


Design XIV. — *A Farm House and Farmery for a Farm of two Ploughs, in the County of Northumberland.*

956. *Accommodation.* The general appearance is shown in the isometrical view, p. 474; and the ground plan in fig. 949. The latter shows, in the dwelling-house, the parlour, *a*; kitchen, *b*; back-kitchen, *c*; and dairy, *d*; with two bed-rooms in the chamber floor, one over the kitchen, and the other over the parlour. The farmery contains a stable for four horses, *e*; a hay-house, *f*; two cattle-hovels, *g*; a barn and straw-house, *h*; foal-house, *i*; calf-pens, *k*; cow-house for four cows, *l*; cow-house for eight cows, *m*; two fold-yards, *n*; and stock-yard, *o*.







957. *Construction.* Fig. 950 shows a section across the house, in which appears the manner of roofing, and also that the floors are paved. Fig. 951 shows a section across the stable, in which is seen the manner of constructing the partitions between the stalls, *p*; and that the partition post, *q*, is let into a stone at the lower end, and at the upper end fixed to the tie-beam. The flooring of the stable is also shown perfectly level, which is consistent with the most improved ideas on this subject.

958. *Estimate.* The total expense of erecting this farm-house and farmery was £550;

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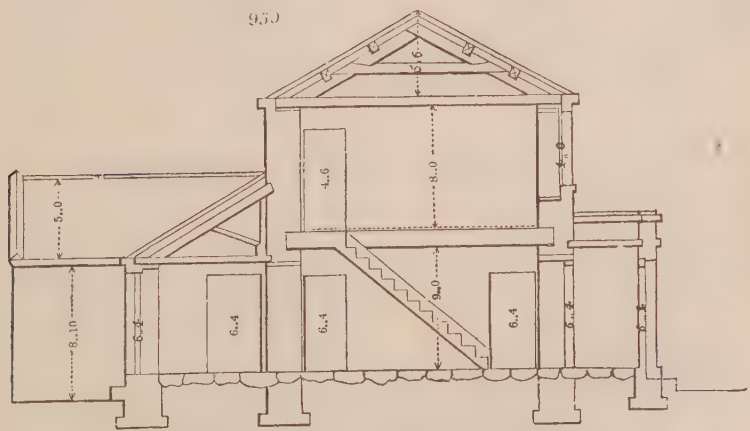

a sum which will appear remarkably low to a London Architect: but it must be recollected, that, in Northumberland, freestone is generally found for the trouble of

working it, on the farm; and that the carriage of all materials is performed by the tenant.

959. *Remarks.* The house has few conveniences, and there is no enclosed kitchen-garden shown: the stack-yard, however, is surrounded by a stone wall; a commendable practice, if it were only for the air of neatness and finish which it gives to the whole.

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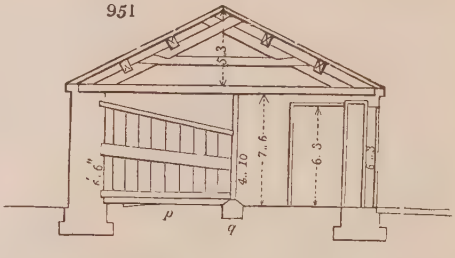
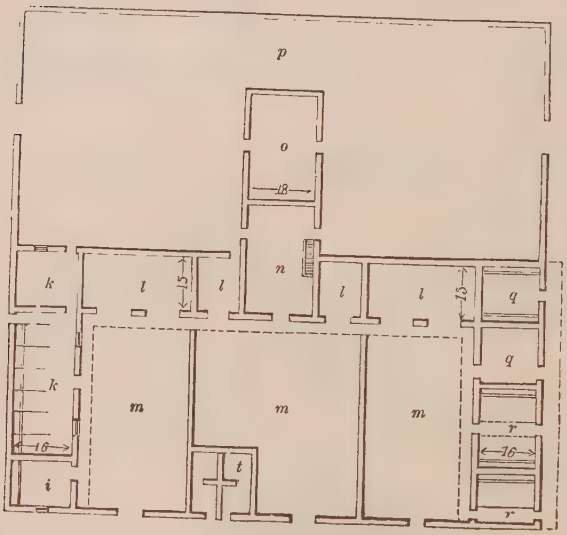


Design XV.—*The Farm House and Offices at Cocklaw East Farm, on the Beaufront Estate, Northumberland.*

960. *Accommodation.* The general appearance is shown in the isometrical view p. 474, and the ground plan in fig. 952. In this plan the farm house contains a kitchen *a*; a parlour, *b*; back-kitchen, *c*; dairy, *d*; coal-house, *e*; and place for ashes, *f*. There is a garden, *g*, enclosed with a wall. The farmery exhibits a cart-shed, *h*; fo..l-



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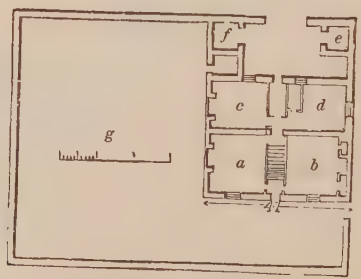

house, *i*; stable and hay-house, *k*; four hovels, *l*; three folds, *m*; straw-house, with granary above, *n*; barn, *o*; stack-yard, *p*; calf-house and turnip-house, *q*; two byres (cow-houses), *r*; two cottages, *s*; and piggery, *t*.

953

961. *Construction.* Northumberland being a county abounding in freestone, the walls are of that material, and the roofs of Baltic timber, covered with Westmoreland slates. Fig. 953 shows a cross section of the dwelling-house. A specification, applicable to Northumbrian farms generally, will be given with a succeeding Design.

962. *Estimate.* The contributor of this Design, John Green, Esq., Architect, Newcastle, having supplied us with the amount of the actual cost of the different buildings composing this Design, we have made out the following table, with a view of obtaining an approximation to the cost per cubic foot: —

	Cubic Feet.	Per Foot. d.	Estimated Cost. £	Actual Cost. £
Contents of the cart-shed, *h*	6,480	2	54	50
Contents of the foal-house, *i*, and stable and hay-house, *k k*	18,000	2	150	145
Contents of two hovels, *b b*	21,432	2	178	168
Contents of the barn, *o*, and straw-house, with a granary above, *n*	25,442	2	212	177
Contents of two cow-houses, *r r*, and calf-house, *q*	18,000	2	150	129
Contents of two pig-houses, *t*, with yards	4,804	2	20	27
Contents of the farm-house, and kitchen offices, *a, b, c, d*, &c.	31,570	3½	460	453
Contents of two cottages, *s s*	11,520	2¾	132	130

From the above it would appear that, in Northumberland, 2*d.* per cubic foot is a fair sum for estimating farm buildings; 3½*d.* for farm houses and their offices; and 2¾*d.* for cottages.

963. *Remarks.* The farm house in this Design is placed on one side of the farmery; but that circumstance, we presume, is owing to some local peculiarity in the surface; since it must, when no obstacle is in the way, generally be desirable to have the house so placed as to command the whole of the farm-yard. In this instance there is not a single window of the living-rooms which looks in that direction. We observe that the fireplaces are all made in the outside walls, which would be bad in a country where fuel is scarce and dear, but which is probably thought nothing of in Northumberland, where it is abundant and cheap.

Design XVI. — *A Farm House and Farmery for seven Ploughs, proposed to be executed in Northumberland.*

964. *Accommodation.* The ground plan of the farmery is shown in fig. 956; and the ground plan of the farm house in fig. 954. The farmery contains a cart-shed, *a*; stable for eight horses, *b*; hay-house, *c*; hovels with yards, *d, e, f*; straw-house, *g*; water-wheel and machinery for threshing-machine, and place for threshed corn, *h h h*; corn-barn for unthreshed corn, *i*; tool-house, *k*; hovels with fold yards, *l, m, n*; foal-house, *o*; calf-house, *p*; cow-house, with stalls between every two cows, *q*; stable for six horses, *r*; hay bay in the stable, *s*; turnip-houses, *t t*; roofed part of the pigsties, *u u*; cribs for fodder in the fold yards, *v v*; kitchen court of the dwelling-house, *w*; and stack-yard, *x*. Fig. 954 is the ground plan of the dwelling-house, in which may be seen a porch, *a*; a sitting-room, *b*; parlour, *c*; dining-room, *d*; store-room, *e*; pantry, *f*; dairy, *g*; with a meat-safe indicated on one side at *p*; kitchen, *h*; back-kitchen, *i*; cleaning-shed, *k*; privy, *l*; place for ashes, *m*, and for coals, *n*. The surface drainage of the kitchen court, *o*, is to two iron traps, *q q*, as indicated

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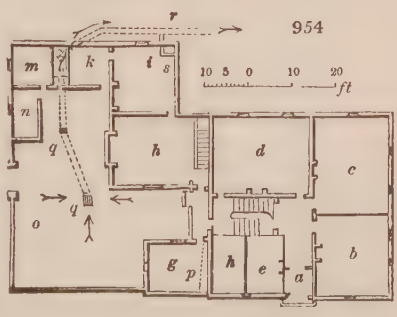

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by arrow-heads; and the water thus collected passes under the privy into a drain, *r*, which also receives the water from the sink-stone, *s*.

965. *Construction.* The walls are of freestone; the exterior angles, and all the jambs of the doors and windows being worked, and the lintels and sills of one piece. Fig. 955 is an elevation of the front of the house, in which a porch is shown, which is formed of stone pilasters. Fig. 957 is a cross section of the stable, showing the manger, *a*; racks, *b*; and the floor, perfectly level, *c*. Fig. 958 is a section across the division walls, *d*, and double cribs of the fold-yard; by which it appears that the posts, *e*, into which are le. the ends of the rails to which the spokes of the cribs are nailed, are of stone, and that the cribs are divided into short lengths by cross rails at top, let into the posts, *e*, and the wall, *d*. Fig. 959 is a section across a single crib.

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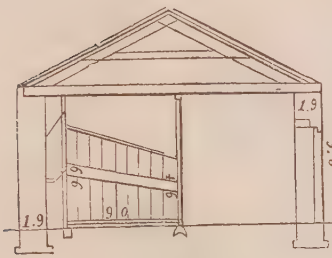

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966. *General Estimate.* The actual expense of building this farmery, exclusive of the farm house, was £1200; and, as it contains 168,560 cubic feet, the expense per foot is about $1\frac{3}{4}d$. The actual cost of the farm house, with the kitchen court and offices, amounted to the same sum; and, as these contain 86,704 cubic feet, the average per foot is $3\frac{1}{4}d$., or thereabouts.

967. *Remarks.* This Design, also by Mr. Green, is for a Northumbrian farm which pays a rent of from £1200 to £1400 a year; the rent being partly paid in money, and partly in the value of the produce, chiefly corn, wool, and butchers' meat. The circumstance of the threshing-machine being driven by water is favourable for the tenant, as requiring fewer horses. The cribs for the cattle in the fold-yards seem remarkably well executed, the posts being of stone. These cribs are two feet wide, and into them the turnips are thrown at one period of the day, and the straw at another. The stables are, as usual, divided into single stalls, and they are lighted by glass windows, which are always favourable for cleanliness. The house is spacious, and appears to contain most of the conveniences required. The connection of the dairy with the kitchen and back-kitchen is good; but the idea of a safe for meat in the dairy cannot be considered as favourable (see § 730). The manner in which the draining of the surface water of the yard is indicated is highly commendable, and ought to be generally adopted. The first points which should be settled, in determining the heights of the ground floors of any assemblage of buildings, are the levels of the underground and surface drainage.

D sign XVII.—*A Farm House and Farmery for Fourteen Ploughs, suited to the Northumbrian Husbandry.*

968. *Accommodation.* Fig. 962 shows the general appearance of the whole; fig. 963 is the ground plan of the farmery; and fig. 960 the ground plan of the dwelling-house. The ground plan of the farmery shows a gig-house, *a*; harness-room, *b*; a stable, *c*, with a loft over it, and a man's sleeping-room over the gig-house and harness-room; a foal-house, *d*; bull-house, *e*; two cow-houses, for sixteen cows, each pair separated by a partition, *f f*; five hovels with fold-yards, *g*; calf-house for twelve calves, *h*; stable for a loose horse, *i*; straw-house, *k*; barn, *l*; steam-engine house, *m*; boiler-house, *n*; tool-house, *o*; poultry-house, *p*; outside stair to the barn, *q*; cart-shed, *r*; cartwright's shop, *s*; blacksmith's shop, *t*; hay-yard, *u*; stable for bailiff's horse, *v*; bailiff's cottage, *w*; turnip-houses, *x*; pig-houses, *y*; kitchen-court of the farm house, *z*; and rick-yard, &. Fig. 960 is a ground plan of the dwelling-house, in which there are a lobby, *a*; a dining-room, *b*; drawing-room, *c*; **parlour**, *d*; office and library, *e*; passage, *f*; kitchen, *g*; back-kitchen, *h*; pantry, *i*; dairy, *k*; wash-house, *l*; place for ashes, *m*; for coals, *n*; best privy, *o*; and servant's privy, *p*. Fig. 961 is a front elevation of the house.

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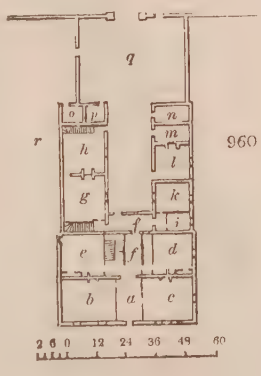

961

969. *Construction.* Native freestone, Baltic timber, and Westmoreland slate are, as usual, the principal materials; and the details of construction are common to all farmeries in Northumberland. We may remark, as not common, the practice of passing from one fold-

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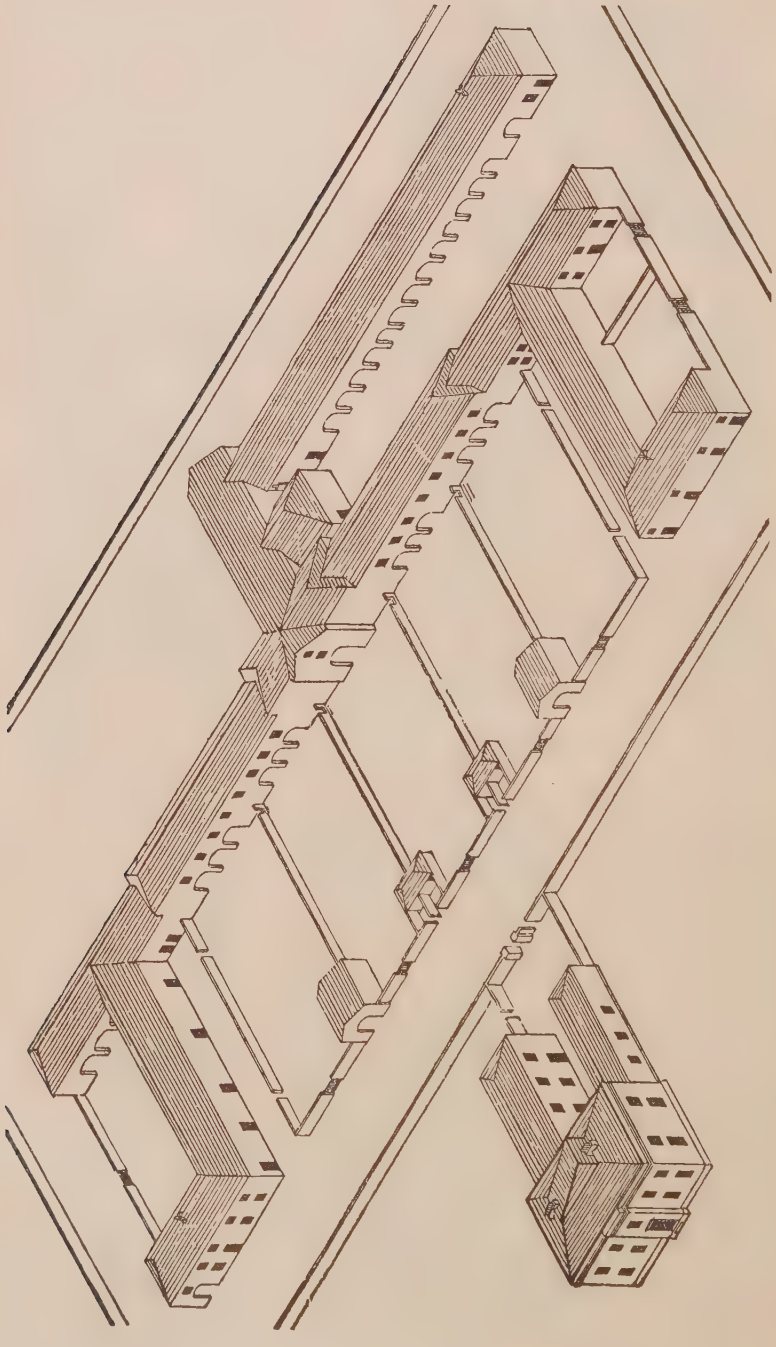

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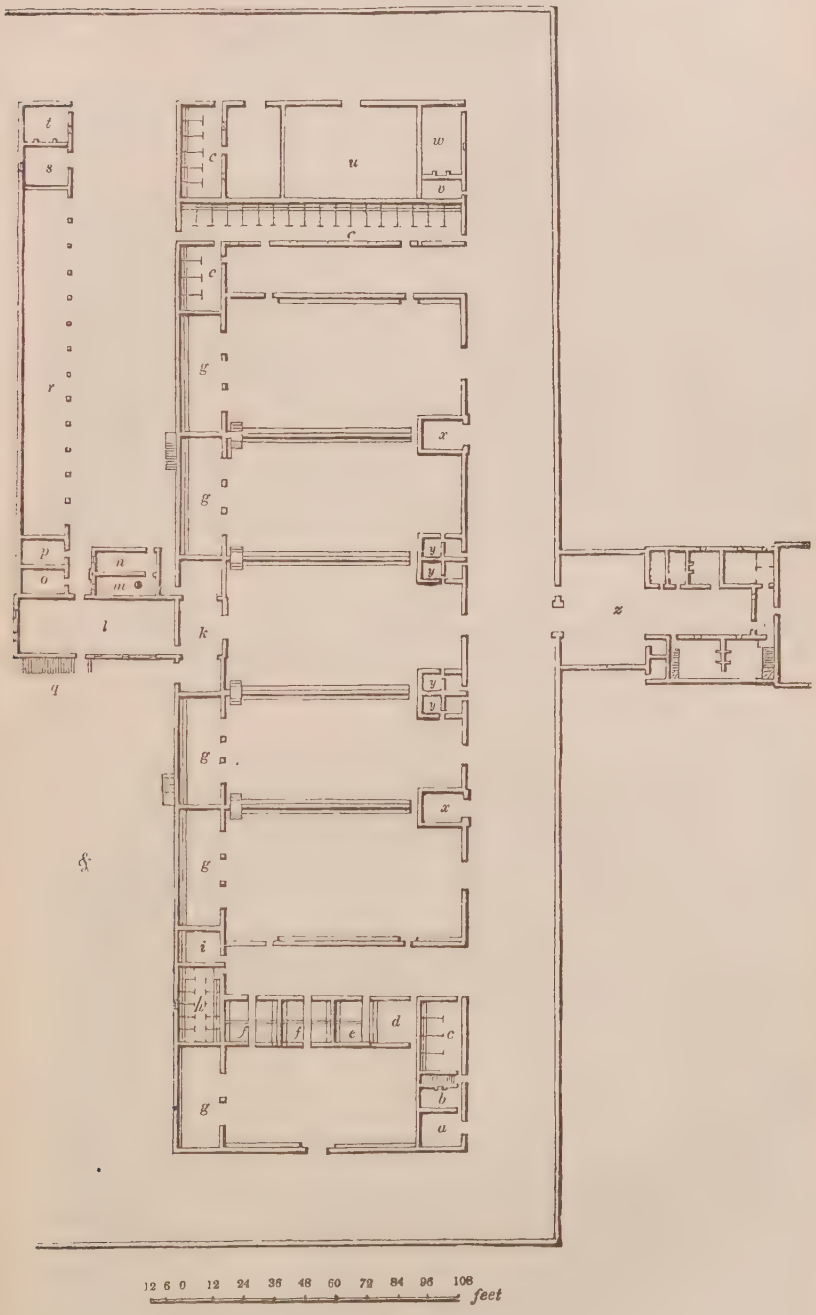
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yard to another, over the separation wall, by ascending three steps on one side, and descending three on the other, as indicated by the section fig. 964. The fodder-cribs, fig. 965, have raised bottoms, grated, in order to let the dust and dirt from the turnips drop through. The hay, when there are cribs for the turnips, is given in racks, placed against the back wall of the hovels, as indicated in the plan, fig. 963. This practice seems a decided improvement.

964

965

970. *Remarks.* The threshing-machine here is driven by steam, which shows a great advance on the practice of employing horses, and one particularly suitable to a coal country, where fuel must be so much cheaper than horse-food. It will be observed in the plan, that the boiler-house, the cart-shed, the cartwright's shop, and the smithy are kept quite apart both from the fold-yards and the rick-yard; which is highly proper, as it prevents all risk from fire getting to straw, and all waste of litter, none being required for this department of the farmery. Taken altogether, this farmery appears one of the most extensive and well-arranged things of the kind that we have seen, and does the highest credit to its Architect, Mr. Green. One circumstance we cannot help remarking; and that is, the commodiousness of the farm house, which contains twenty-eight windows, and twenty-eight apartments; while the dwelling of the bailiff, or superintending hind, as he is called in Northumberland, consists of only one apartment, and one small window. The horses and cows, nay, even the swine, are incomparably better lodged, considering their scale in creation, than the unfortunate occupant of such a cottage as is here shown: but the farmers of Northumberland, like those of Scotland, are under the dominion of an all-powerful aristocracy, and their servants are little better than serfs; or, as it has been observed in the *Morning Chronicle*, the landlords are the slave-owners, the farmers the slave-drivers, and their servants the slaves.

Design XVIII.—*A Farm House and Farmery for Ten Ploughs, Ten Cows, Twenty Young Cattle, and other Live Stock, adapted to the Husbandry of Northumberland.*

971. *Accommodation.* The general appearance is shown in fig. 966, and the ground plan in fig. 967. In the latter, the house contains a kitchen, *a*; dining-room, *b*; parlour,

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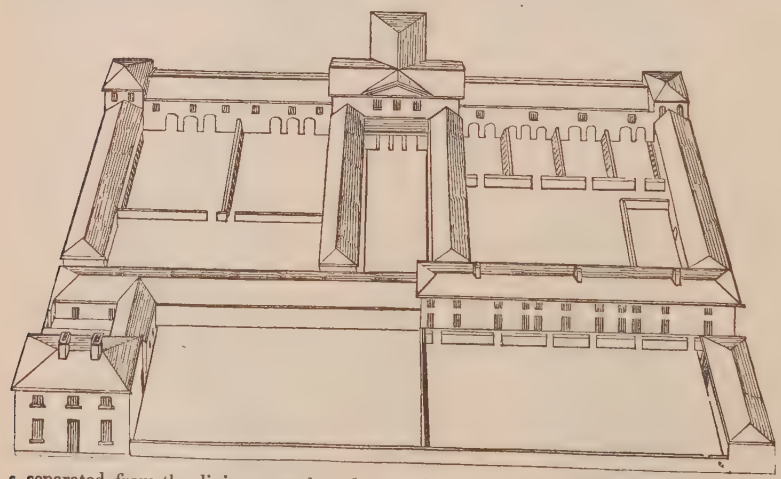

c, separated from the dining-room by a large hall or lobby; office, or place of business, *d*; dairy, *e*; covered passage, open in front, *f*; back-kitchen, and dairy-scullery, *g*; privy for servants, *h*; best privy, *i*; kitchen court, *k*; place for ashes, *l*; and walled kitchen-garden, *m*. The farmery contains in the barn a compartment for unthreshed corn, 1; another for threshed corn, 2; a space for machinery, 3; and a large straw-house, 4. At one end of the straw-house is a stair to a granary which extends over the straw-house and cattle-sheds 5 and 6. The cattle-sheds, or hammels, are of three kinds; hammels for beeves upon turnips, 5; hammels for stirks, 38; and hammels for store cattle on straw, 6. Every hammel has its yard; those for the cattle on straw, 39, being largest, because

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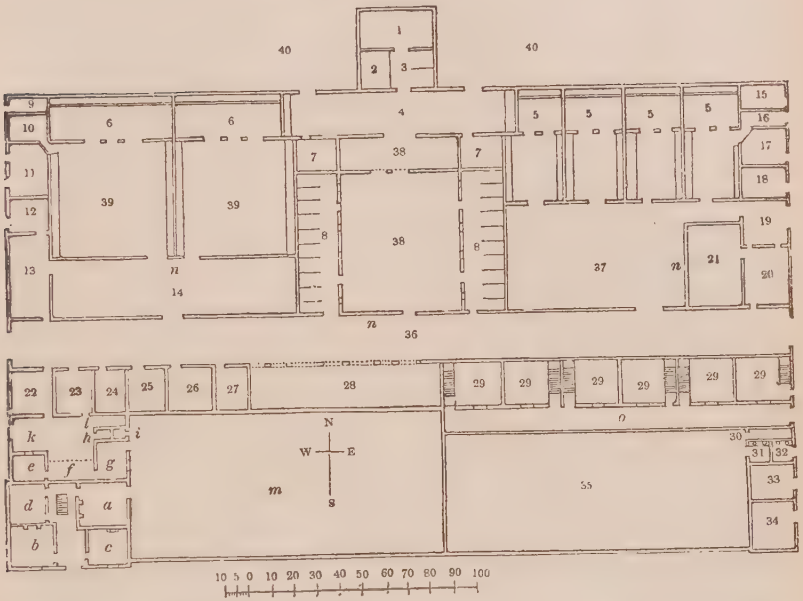

a number are put together; and those for the beeves being smallest, because they are understood to be fattening. The yard for the stirks, 38, is also the yard for the stables. There are two hay-rooms, 7 7; and two stables for ten horses each, 8 8; a poultry-house, 9; pigsty, 10; calf-house, 11; foddering-bay for cow-house, 12; cow-house for ten cows, 13; yard to the cow-house, 14; vacant house, to be used as a slaughter-house, or for pickling wheat, or for various other purposes, with a dovecot over, 15; store pigsty, 16; house for a bull, 17; house for a stallion, 18; feeding-house for cows, 20; and yard for cow-house, 21. There are a boiling-house, which also serves as a wash-house for the family, 22; a coal or wood-house, 23; stable for a riding-horse, 24; an hospital, 25; a carpenter's shop, 26; a tool-house, 27; cart-shed, 28; and six cottages for ploughmen, 29. Belonging to the cottages there are a place for such rubbish as cannot be turned into manure for the cottage gardens, 30; a privy for the women and children, 31; and a privy for the men and boys, 32. To complete the establishment, there are a blacksmith's shop, 33; and a cow-house for the six cows of the cottagers, 34. Each cottage has a garden in the enclosure marked 35. To supply all the animals with water, there are pumps at *n n n*, besides a pump in the kitchen court, and one at *o*, for the cottagers. There are a broad passage or roadway between those offices which are unconnected with working, feeding, or store animals, and the farm yard, 36; a yard for store turnips, 37; one for stirks, and for the stables, 38; two for cattle feeding on straw, 39; and an extensive rick-yard, 40.

972. *Remarks.* This Design has been sent us by one of the most extensive farmers in Northumberland, an enlightened and liberal-minded man, and a much valued contributor to our *Encyclopædia of Agriculture*, *Gardener's Magazine*, and *Magazine of Natural History*, accompanied by the following remarks:—"This Design is sent to show you what we in Northumberland consider some of the essentials in the arrangement of a farm steading. It scarcely ever happens that a whole homestead has to be built at once; and the nature of the ground, or of the farm roads, frequently causes a variety of modifications in the different buildings here exhibited. In explaining what these essentials are, it may be necessary to state the reasons why the barn, in fig. 967, is made thirty feet wide, instead of sixteen or eighteen feet, which is the usual width. This is done that there may be sufficient space for a stack of unthreshed corn, and also two bays for threshed corn, in order to supply work for the men and horses, in weather so bad, that corn would be injured in carrying it from the rick-yard to the barn; and to contain a large quantity of threshed corn, when there may not be time, on account of out of doors work, to clean and measure it up, and raise it into the granary. The straw-house, 4, may

also seem large; but the advantage of having occasionally, or rather always, a store of dry straw is great; and in a large straw-house the different kinds for the keeping or feeding of cattle may be kept separate without inconvenience. The hammels, as well as the other cattle-houses, it will be seen, are so situated as to be supplied with straw from the straw-house with the least possible labour; they are also all made to front the south; as that aspect, in Northumberland, offers so much more warmth and comfort to the animals, as to render the food given much more effective in fattening them than it would be in houses facing the north, or even the east or west. The cattle wing is placed on the west side of the quadrangle, near the dwelling-house, as being more convenient for the cows and calves; and the stables are placed near the centre, with hay-houses, 7 7, at their farther end, to which access may be had through large folding doors in the straw-house. The hay, may, therefore, be carried to the feeding stock dry, and may be lodged under lock and key, and given into the charge of a fodderman; under which circumstances, it is considered much less liable to waste; the expense of lofting the stables is also saved, and the stables are thus rendered more healthy for the horses. As a long range of buildings fronting the south might be exposed to a sweep of wind from the east or west, the stables are carried up close to the fodder-house, for the purpose of breaking such a current, and of rendering the folds more sheltered, particularly the middle one; which, on this account, and from its being the most convenient for receiving the stable litter, is particularly eligible for the yearling cattle (stirks), which the Northumbrian farmers think are less liable to the quarter ill, when allowed to eat the refuse hay and litter from the horses, of which they are very fond. The feeding cattle are now generally fed in sheds opening into a loose yard, three, five, and sometimes more, being placed together, with the exception, occasionally, of old cows, which are usually tied up; for these there is a feeding-byre, 20, in the east wing, which, however, may also be converted into a feeding-hammel. Both a turnip-house, 19, and a turnip-yard, 37, are given; the first is principally useful during winter frosts, though excellent beeves may be fed with turnips which have been stored in the open yard, when they have been well covered with straw. The cart-shed, which more farmers consider necessary than can boast of having, is placed near the stables, and fronting the north; that being considered the best aspect for preserving those implements. The tool-house is also near, and the remainder of this range to the west may be considered most conveniently situated. The dwelling-house is placed a little in advance of the west wing, and is as near the farm-yard as it well can be, without being subjected to its nuisances. The dairy is shown rather detached, because it is better at some distance from the heat of the kitchen; and its window is to the north, as that is requisite for preserving the milk sweet during the hot weather of summer. The cottages are to the east of the south range; and if built like Mr. Bardwell's, § 477, fig. 423, with sleeping apartments above, they will be of sufficient size. They are better placed together than detached, as, by their vicinity to each other, a dishonest servant is prevented from pilfering, from the fear of being detected and exposed by his neighbours. Their cow-houses, and the blacksmith's shop, are placed on the east, to complete the quadrangle, where also other conveniences may be added, if thought necessary. The wash-house, 22, at the west end, is intended either to boil horse or cow food; or where many harvesters (reapers) are employed and fed, it may be used as a cooking-house." We value this plan highly, knowing the competency of its author. We are gratified to observe that the cottages for the labourers are proposed to be formed, like Mr. Bardwell's, with one large room and two closets on the ground floor, and two bed-rooms over. The worst point about the Northumbrian farmeries, as well as those of Scotland, is the boothies, or little booths, for the single men, and the houses of one room for the married servants.

Design XIX. — *A Farmery for Five Ploughs, with Cows, Cattle, and other Stock in Proportion, suitable for the Northumbrian Husbandry.*

973. *Accommodation.* No farm house is here shown, but merely the offices of the farmery; the general appearance of which is exhibited in fig. 968, and the ground plan in fig. 969. The latter contains the barn bay for unthreshed corn, *y*; the bay for threshed corn, *z*; the machinery, *c*; and the straw-house, *d*: the stable, *e*, has separate stalls for ten horses; and connected with it is a hay-house, *f*. There are a tool-house, *g*; straw-yards, and hammels, *h*, *i*, *k*, *l*; calf-house, *m*; stable for a loose horse, *n*; cow-houses, *o*, *p*; hackney stable, *q*; and four feeding-hammels, with yards, *r*, *s*. There are a vacant house for an hospital, and for various other purposes, *t*; a cart-shed, *u*; turnip-house, *v*; a common yard, *w*; and rick-yard, *x*. There are pumps for supplying water, at *a' a'*; and upright racks along the divisions between the fold-yards, at *b' b'*, &c.

974. *Remarks.* On this Design, which has been sent us by the same experienced agriculturist as the preceding one, its author thus remarks: — "No dwelling-house or cottages are attached, nor a blacksmith's nor carpenter's shop; because these may be added

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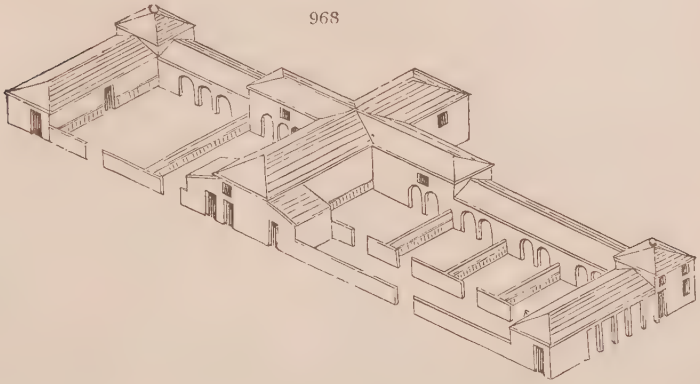
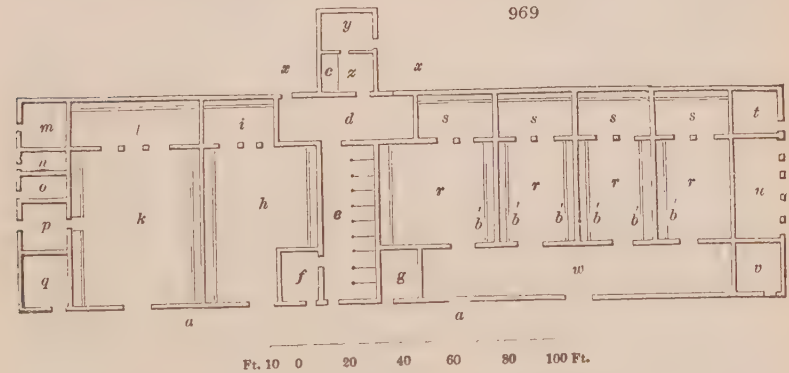


where deemed most convenient. Many of the observations made on the preceding Design will apply also to this one: the cart-shed, however, fronts the east, which is the next desirable aspect to the north."

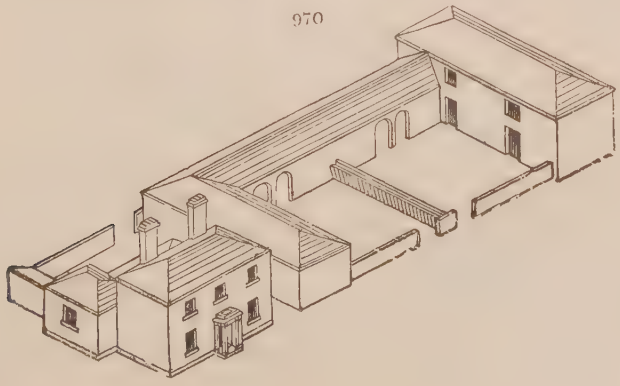
969



Design XX. — *A Farm House and Farmery for Three Ploughs, adapted to the Northumbrian System of Culture.*

975. *Accommodation.* Fig. 970 shows the general appearance; and fig. 971 the ground plan. In the latter the dwelling-house shows an entrance-lobby and staircase, *a*;

970



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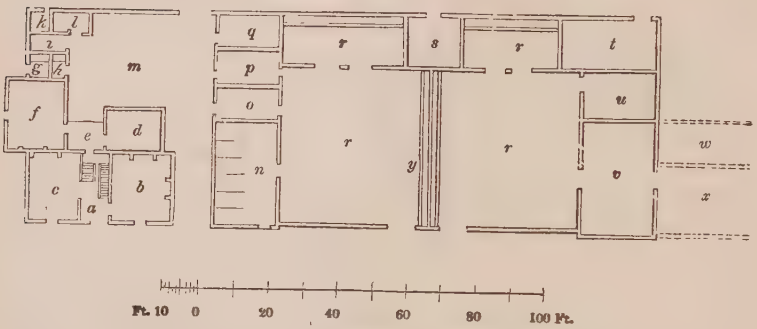


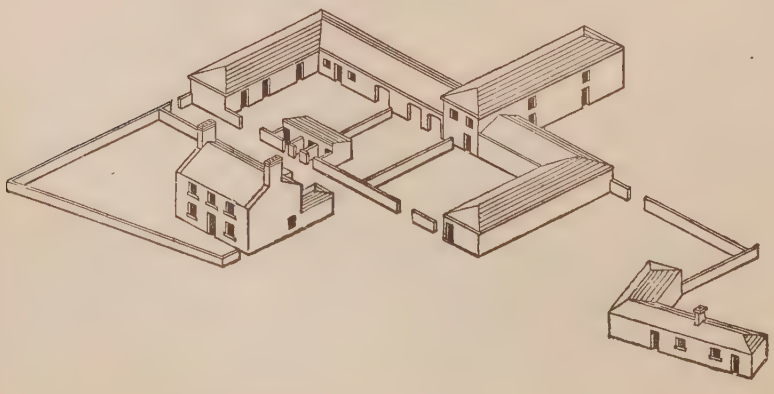
parlour, *b*; kitchen, *c*; dairy, *d*; drying-shed, *e*; back-kitchen and dairy-scullery, *f*; servants' privy, *g*; best privy, *h*; place for ashes, *i*; pigsty, *k*; poultry-house, *l*; and kitchen yard, *m*. The offices show a stable for six cart-horses, *n*; hackney-stable, *o*; cow-house, *p*; calf-house, *q*; hammels and yards, *r*; house for a loose horse or bull, *s*; bay of the barn for unthreshed corn, *t*; threshed corn and machinery, *u*; straw-house, *v*; situation in which cattle-sheds may be extended, *w*, with yards, *x*. A pump, placed at *y*, will supply the whole of the farm-yard, and the kitchen court may have one in any convenient angle. The rick-yard is at *z*.

976. *Remarks.* This Design, by the same contributor, is for what is considered in Northumberland a small farm. "It is chiefly intended for keeping cattle, and may be extended towards the east, as shown by the dotted lines, *w*, *x*. The additional hammels, *w*, may be covered by corn stacks, as roofs, and especially with beans, a very general practice in Northumberland. There is a dwelling, but no buildings are shown, for servants or workmen. The cattle-sheds are all lofted, such lofts forming better granaries for keeping corn than those over close cattle-houses or stables; because the corn is not injured by the breath of cattle confined below. The whole range of building on the north side of this yard is shown two stories high, for the sake of sheltering the fold-yards. The stables in this Design, and in the two preceding ones, ought to be between sixteen and eighteen feet wide; and, if a recess with a small window in it were made behind each pair of horses, a convenient place would be formed there for keeping harness above, and for placing a corn or chaff bin below. The light and the ventilation which would be afforded by the window would admit of keeping the stable much more sweet and clean than is usual; for it is certain, as White observes, that 'there is nothing like light for exposing a negligent servant.'"

Design XXI.— *The Farm House and Offices for a Farm of Six Ploughs, called Hallington New Houses, on the Beaufront Estate, in Northumberland.*

977. *Accommodation.* The general appearance is shown in fig. 972, and the ground plan in fig. 973. The latter shows the farm house, containing a kitchen, *a*; parlour, *b*;

972



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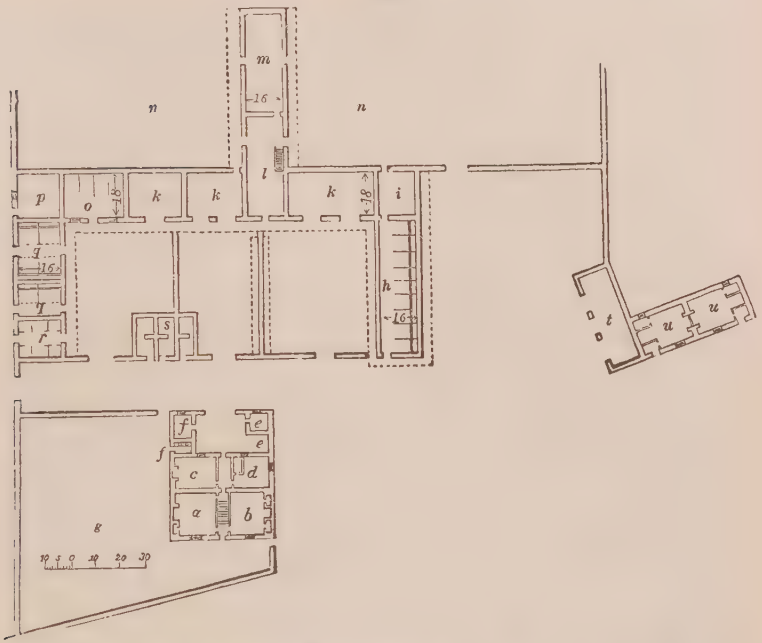

back-kitchen, *c*, with four bed-rooms and a closet over. There are also a dairy, *d*; coal-house and shed, *e*; ash-house and privy, *f*; and garden, surrounded by a wall, *g*. The farmery contains a stable for nine horses, *h*; a hay-house, *i*; three hovels with their fold-yards, *k*; a straw-house, with granary over, *l*; a barn, *m*; stack-yard, *n*; stable for four horses, *o*; foal-house, *p*; cow-houses, *q*; calf-house, *r*; piggeries, *s*; cart-shed, *t*; and two cottages, *u u*.

978. *Construction.* The walls are of the freestone found upon the estate; the timber is of Baltic fir, and the covering of the roofs of Westmoreland slate. There is nothing peculiar or specific in the fitting up of the buildings composing the farmery; and the interior of the dwelling-house is finished in the usual manner, as appears by the section, fig. 974. As a specimen of the manner in which the particular, or specification, of the work to be done in building a farm house and offices in Northumberland is made out, we are enabled, through the kindness of Mr. Green, to subjoin the following form, being that actually made for rebuilding this farm:—

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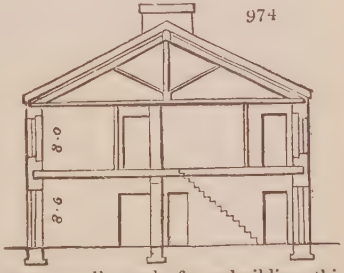

979. *Specification and Description* of the several works to new farm buildings intended to be erected at Hallington New Houses, on the estate of J. Errington, Esq., of Beaufront, in the county of Northumberland, according to the plans, elevations, and sections hereunto annexed.

980. *The Contractors* shall, at their own cost and charge, provide all and every kind of material; labour, including the digging and quarrying stones; workmanship; tools; travelling, lodging, and every other expense attendant on the works, except cartage, which is to be supplied by the tenant. All the materials to be of good quality of their several kinds; and the mortar for building the walls to be composed of good well-burnt lime, mixed with clean sand; using not less than one cart-load of lime to three cart-loads of sand, and having them well mixed and beaten together with water. The stones to be got from a quarry which is to be opened on the farm; the contractor to find labour for opening and laying bare the stone; but the tenant to supply what cartage may be neces-

sary. The timbers for all the carpenter's work; viz., roofing, lintels, bond timber, stoothings (studwork, or quartering; that is, wooden framework for lath and plaster partitions), ragglings (ceiling joists), joistings, external door-frames, posts and rails for stalls in stable, cow-byre, and calf-pens, to be all sawn out of Memel, Dantzic, or red pine timber. The deals for the external doors, windows, gates, stall partitions, mangers, and hay-racks, and for the steps and risers to stairs, to be all of red wood from the Baltic. All the floors of the house and granary to be laid with white-wood battens from Christiania. All the other inside joiner's work to be executed with deals, &c., cut out of Quebec yellow pine. The whole to be free from sap, shakes, loose knots, and every other defect. The materials of the present old buildings to be taken for the use of the respective contractors; and such of them as shall be deemed sound and good by the inspector, such as stones and timber, to be used in the new offices. The old buildings, however, are to be taken down only in such order of time as they can be spared by the tenant, so as he may not be put to unnecessary inconvenience thereby.

981. *Dwelling-House. — Mason's Work.* To open out, and lay bare the quarry where pointed out; and to get from it all the stones necessary for the mason-work; to dig proper trenches for all the walls, of the different thicknesses, and to the depth required for a good foundation, and also for sleeper walls to the parlour floor. To build stone footings to all the walls, from good foundations, of the different thicknesses described on the drawing; the first footing to be 3 feet, and the second ditto 2 feet and a half. To carry up all the external walls 2 feet thick, and the internal walls, and walls of coal-house, privy, &c., 20 inches thick, to the heights required, as shown by the elevation and section. The front of the house to be built with good blocking courses of hewn stone ("good blocking courses" does not mean, in Northumberland, hewn work, but only stones dressed with the pick end of the hammer, and laid in regular courses, which courses are generally of such a thickness, as that two of them range with one course of coins, as in fig. 975). The jambs of the doors and windows to be carried up in in and out tie (in and out tie, or in-bands and out-bands, are analogous to headers and stretchers in brickwork; and, in the case of windows and other openings, will be understood by fig. 976,

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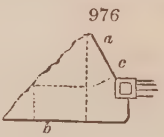

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in which *a* is the in-tie, in-band, or heading stone; and *b*, the out-tie, out-band, or stretching stone; and *c*, the pulley style of the windows; the external elevation of in and out tie may be seen in fig. 977); checked (rebated) to receive frames; the inside of the jambs to be splayed; to have wooden bricks built in for fastenings of the beads, and recesses left for window seats. The gables of the house and back side to be built with good common walling; the whole of the walls to have a bond stone (binding stone) laid through the full thickness of the wall every superficial yard, and to be properly pointed outside. Windows and doors to have stone heads and sills, chiseled and set. The sills to have proper drips, and to project 2 inches from the face of the wall. The coins (corners) for all the walls to be chiseled, and to be from 12 to 14 inches deep, 20 inches long, and 10 inches in the bed. Two courses of blocking in the front wall to range fair with one of coins. The chimneys to be carried up with gables, as shown in the drawing. The vents (flues) to be well pargeted inside, with hair and lime; and the tops above the roof to be built with hewn stone, well jointed; each joint to have a wrought-iron cramp, three eighths of an inch square, and 5 inches long, run with lead. Stone water-tables to be laid up the gables on each side, and to be wrought with saddle top, chiseled and set; the first stone to be fixed with an iron stud, run with lead, into corbel coins (summer stones, as shown in fig. 977), also a stone ridge, wrought fair to a mould, well jointed and laid straight on the roof. To pave the two kitchens, dairy, pantry, passages, and closet under the stairs with flag-stones, 3 inches and a half thick, from Erring Craig: the whole to be dressed, jointed, and well bedded in sand. The front and back doors to have stone steps and thresholds, chiseled and set. The fireplaces in the front kitchen and back ditto to have stone jambs and mantels chiseled and set. The mantels not to be less than 15 inches deep, and the jambs the breadth required. Each fireplace to have a furnace pot (boiler) and oven (the front kitchen pot to contain 12 gallons of water; the oven to be 20 inches in diameter); and standard grates, (kitchen grates supporting themselves by feet in front,) 20 inches wide, set with hewn stone fronts, coved behind for the pot mouth (boiler mouth, as in fig. 978; in which *d* is the pot or boiler; *e*, the coving; *f*, the jamb; and *g*,

the bottom of the standard grates); the back-kitchen fireplace to have a standard grate, 20 inches wide, and the pot to contain 16 gallons of water. The whole to be properly set with cast-iron dampers and fire bricks; to have end plates and a hook fixed for the top bar to fall down. The fireplaces in the bed-rooms and parlour to have polished stone jambs, mantels, and fire slabs, and side slips where required; each to have a sham stove of the value of 15*s.* each, the parlour fireplace to have metal cove plates (metal side pieces, coved to the jambs above the stoves, as in fig. 979, in which *h h* are the cove plates), and the whole to be properly set. To pebble-pave the yard to the house, coal-house, ash-house and shed; the privy to be flag-paved. The front and back doors to have flags laid in the front of the steps, 4 feet by 4 feet. To build the garden wall, as shown in the plan, with common walling, 20 inches thick, and 6 feet high, with coins at the angles, and to have the coins of the gate openings scappled (broached ashlar dressed roughly with the pick end of the hammer).

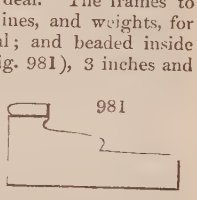
979

982. *Plasterer's Work.* To plaster all the walls of the house with two-coated plaster; and also all the jambs of doors and windows. The soffits of the same to be lath-plastered where required. The ceilings of all the rooms, passages, and of the staircase with stoothing partitions, to have two-coated lath-plaster; also the partitions forming closets to have the same. The privy to have two coats of wall-plastering, and the ceiling to have two coats of lath-plaster. The lime for the whole of the above to be well prepared, and mixed with a sufficient quantity of long beast's hair; the whole to be well smoothed off, and left free from blushes (blisters) and every other defect, when finished. The mason to cut all the holes necessary for the carpenter's and joiner's work, and for the smith's work, &c.; also to provide lead for running in ditto. Grooves to be cut, when required, for the slating; and the whole to be done to the satisfaction of Mr. J. Green, Architect, or whom he may appoint to inspect the same.

983. *Carpenter and Joiner's Work.* To provide and cut all the necessary wooden bricks; lintels for door and window openings, and wall plates for joisting, of such scantling as will be hereafter specified. The joisting for the chamber floor to be laid level at top, and fair underside for the ceiling, and not to exceed 16 inches apart, middle and middle (from centre to centre). The joists to have 12 inches hold on the wall at each end, and to be laid on wall plates; to be trimmed for the chimneys and staircase, as may be required; and to be of such scantling as will be hereafter specified. The joisting for the parlour floor to be laid on sleeper walls, not to exceed 18 inches apart, middle and middle. The fire hearths to be boxed with 1 inch and a quarter deal. The roof to be framed, as shown in the section, with four pair of principals (principal rafters); the common rafters to be laid so as not to exceed 18 inches apart, middle and middle, a course of five-eighths inch deal sarking (boarding), 9 inches broad, to be laid along the eaves and the ridge, on each side of the roof and chimney necks (shafts); also five-eighths inch deal sarking laid up the gables, 2 feet wide on each side, to meet the slate laths in the middle of the second spar from the gable. The beams to be laid on raising plates, (wall plates) with a proper bearing on the same. The ceiling joists to be fixed to the underside of the tie beams, and not to exceed 16 inches apart, middle and middle. A trap-door to be made and fixed in the ceiling where directed, to give access to the roof. Stoothing partitions to form rooms, pantry, closets, &c., to be fixed as shown on the drawing; the stoothings (quartering) not to exceed 16 inches apart, middle and middle, the scantlings to be hereafter specified. Partition door-frames to be beaded, rabbeted, and fixed with stoothings, where shown in the drawing. The closet door-frames to be beaded, and fixed with stoothings to form closets, as shown in the drawing. The chamber floors and parlour ditto to be laid with inch-and-quarter white-wood battens; dressed and jointed, and well nailed to joists; the battens to be dressed and jointed immediately after the contract is made, and horsed (set up on end in the open air to dry, against a horizontal spar or horse, the end of which is shown at *i*, in fig. 984), so as to be properly seasoned before laying down. The coal-house, shed, and privy, to be covered in with a pitched roof (a roof raised in the middle, and not at one side only, as in lean-to roofs), as shown in the drawing; scantlings hereafter specified.—Scantlings. Chamber flooring joists, 9 inches by 2 inches and a half, 16 inches apart, middle and middle; sleeper joists for parlour, 6 inches and a half by 2 inches and a half; 18 inches apart, middle and middle; principal rafters, 9 inches by 3 inches; tie-beams, 8 inches by 3 inches and a half; king-posts, 11 inches by 3 inches and a half; ridge-pieces, 7 inches by 1 inch and a half; ribs, 5 inches by 3 inches and a half; struts, 5 inches by 3 inches; common rafters, 3 inches by 2 inches and a half; ragglings, 3 inches and a half by 2 inches; stoothings, 3 inches by 2 inches and a half; wall plates under joists, 4 inches and a half by 1 inch and a half; raising plates under tie-beams, 6 inches and a half by 2 inches and a quarter; lintels for doors and windows, 4 inches

980

thick, by the breadth required; wall plate at foot of spars, 9 inches by 1 inch and a quarter; partition door-frames, 4 inches and a half by 3 inches and a quarter; closet door-frames, 3 inches and a quarter by 3 inches; external door-frames to house, 4 inches and three quarters by 3 inches and a half; principal rafters for shed and coal-house roofing, 6 inches and a half by 2 inches and a half; common rafters, 2 inches and a half by 2 inches and a quarter; ribs, 4 inches and a half by 3 inches and a quarter; wall plates, 6 inches and a half by 1 inch and a quarter; ridge pieces, 6 inches by 1 inch and a half; pan plate, wall plate, and lintel, 3 inches and a half thick. — Windows. All the windows for the house to have boxed sash frames of red-wood deal. The frames to have 1-inch pulley stiles (hollow stiles, containing the pulleys, lines, and weights, for balancing the sashes), outside linings of three-quarters-inch deal; and beaded inside linings of half-inch deal, with the sash sill double sunk (see fig. 981), 3 inches and a half thick by the breadth required. The heads to be of 2 inch deal, boxed out the breadth of the side frames; three-eighths-inch parting (separating) beads grooved into pulley stiles; inside beads, three quarters of an inch and seven eighths of an inch broad; the sashes to be 1 inch and three quarters, stuck (worked) with astragal and hollow; sash bar, five eighths of an inch thick; the stile of sashes to be 1 inch and three quarters broad. The whole to be single hung with cast-iron weights and proper sash line; and to have cast-iron framed pulleys; each window to have a brass sash fastener fixed, of the value of 1*s.* 9*d.* The low room (ground floor) windows to have inside shutters framed of inch-and-quarter deal, in two panels, planted (inlaid) moulding, plain back flaps of three-quarters-inch deal, clamped at the ends; shutters to be hung with two inches and a half metal butt hinges; and the back flaps with 1 inch and a half wrought-iron ditto, and screws. Each shutter to have a plain brass knob, and a window shutter bar, 2 feet and a half long, fixed to each window. All the windows to have inch-and-quarter deal bottoms, with plain backs and elbows (casings round the window seats) of 1-inch deal beaded; the upper edge and plain soffits to be of three-quarters-inch deal, grooved and tongued. The parlour window to have framed backs and elbows down to the floor, with a framed soffit of inch-and-quarter deal, to correspond with shutters. The plinth to be fixed round the window, 4 inches and a half broad. Framed grounds 4 inches and a half by 1 inch and a quarter, beaded and splayed inside, to be fixed round the windows in the parlour and in the two kitchens, with a three-quarters-inch ogee back moulding. The upper room windows to have a three-quarters-inch angle bead fixed round the jambs and heads. The dairy and pantry windows to be made with solid frames, 3 inches and a half by 3 inches; to have sliding trellises inside, with glass above, one square in height; and to have inch-and-quarter deal bottom made level with shelving. The jambs and heads to have a three-quarters-inch angle bead fixed. The dairy and pantry shelving to be fixed, as shown on the plan, by dotted lines; to have three shelves in height; their united breadths not to be less than 4 feet; and to have proper framed bearers. All the external angles of the chimney breasts, jambs, and heads of door openings to have three-quarters-inch angle beads fixed, and on such other places as require them. The closets to be fitted up, as shown in the drawing, with 3 shelves in height, of 1-inch deal; their united breadths not to measure less than 3 feet. The stairs to be fitted up in one flight, as shown on the plan, with inch-and-quarter deal steps and risers. The steps to have rounded nosings chimed (let in) at both ends into stringings, which are to be of inch-and-half deal, and 10 inches broad; with a dressed and beaded upper edge to answer as skirting. A wrought deal handrail to be fixed to stoothings on each side of the stairs. Moulded skirting to be fixed round the parlour of 1-inch deal, 6 inches broad; to be fixed to the wall with plugs. Plain skirting of three-quarters-inch deal, 4 inches and a half broad, to be fixed round the kitchen, back-kitchen, passages, bedrooms, &c. The parlour fireplace to have a plain pilaster chimney-piece, 4 inches and a half broad, with shelf and frieze. The bed-room fireplaces to have a single fire moulding, with a plain shelf and frieze. The two kitchen fireplaces to have each a chimney shelf of inch-and-quarter deal, fixed with ogee brackets. All the room door-frames to have a three-quarters-inch quirk ogee moulding, planted (fixed) round on each side, also round the closet door-frames, to cover the plastering. The upper room doors, and the dairy and pantry ditto, to be framed in four panels of inch-and-half deal, finished and planted on one side. To be hung on frames, with 3 inches and a half butt hinges, and each to have a good Norfolk latchet (latch). The cheese-room door and pantry ditto to have iron-rimmed locks of the value of 2*s.* 6*d.* each, with escutcheons. The low room doors to be also framed in four panels of inch-and-half deal finished, planted moulding, both sides hung on frames, with 3 inches and a half butts; the parlour door and kitchen ditto next to the stairs to have each an iron-rimmed lock



with Scotch springs, and plain brass knobs of the value of 5*s*. 6*d*. each. The closet doors to be framed in four panels of inch-and-quarter deal; with planted mouldings on one side, to be hung with 3-inch butt hinges, and to have closet door locks of the value of 2*s*. 6*d*. each. The front door to be framed 1 inch and three quarters thick, in 6 panels, bead and flush outside; and hung with 4 inches and a half butt hinges on frames beaded and rabbeted, with a light above. The back entrance door to be framed 1 inch and three quarters thick, in four panels, bead and butt, and hung on frames, beaded and rabbeted, with 4 inches and a half butt hinges. Each of the above doors to have a stock lock of the value of 6*s*., and a good Norfolk latchet. 20 feet run of pin rail (railing for hat or cloak pins) to be fixed in the kitchen where required. The trap-door, made for the ceiling, to be of half-inch deal, grooved and tongued, with beaded lining round the frame. The privy to have a boxed seat of inch-and-quarter deal, grooved and tongued, and a battened door of 1-inch deal, hung on frames, beaded and rabbeted, 4 feet by 3 feet, with T bands (hinges like fig. 982) 2 feet long, and to have a Norfolk latchet, with a small bolt inside. The coal-house door, and ash-house ditto, to be of inch-and-quarter deal, hung with bands (strap hinges) and crooks (hooks) run into stone cheeks (jambs), 2 feet 2 inches long, with two screw-bolts and nuts in each band. (N. B. No doors or window shutters to be hung on mouldings fixed in any part of the house where the plastering is unfinished, except on the window grounds and skirting.)

982

984. *Hardware* (Ironmongery). To provide all the nails, spikes, screws, &c., that may be necessary for the carpenter's and joiner's work; also all the hardware, as before specified; two dozen of iron crooks to be fixed in the ceilings of the kitchen, or in such other parts as shall be directed. To fix along the eaves of the roof on both sides half round metal spouts (see fig. 983), with two metal wall pipes. The whole to be fixed with a sufficient number of iron stays and holdfasts.

983

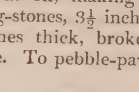
985. *Slater's Work.* To cover the roof of the house with Welsh slates called countesses, laid with a sufficient overlap, and well nailed, with two nails to each slate, to Memel laths 1 inch and a half by five eighths of an inch; the laths to be well nailed to spars (common rafters). The whole to be well pointed inside with good hair and lime mortar, and inserted into grooves at the chimney necks; also to be well pointed up the gables and along the ridge; the whole to be sound, and left perfectly watertight when finished.

986. *Glazier's and Painter's Work.* To glaze all the windows with the best Newcastle second crown glass, to be well fitted and bedded in good oil putty. The windows to be primed before glazing. Pantry and dairy windows to have glass above the trellises one square in height, also the same above the front door. To paint all the outside joiner's work, viz., doors, windows, &c., and all the metal spouts, with three coats of good white lead and oil; and all the inside joiner's work, viz. the doors, windows, mouldings, linings, skirtings, handrails, &c. &c., with two coats of white lead and oil, or with such other colours as may be required. The whole work to be well puttied up, and knotted (the knots smoothed and filled up) previously to painting.

987. *Farm Offices. — Mason's Work.* To dig proper trenches for the foundations of all the walls to the new buildings, the proper thicknesses, and to the depth required. To take off the covering, and pull down the walls of such of the old buildings as are to come down; the old stones to be used for the inside of the walls to the new buildings; and the new stones wanted, to be from the aforementioned quarry. To build stone footings to all the walls for the new buildings, as shown on the plans, 2 feet and a half wide, from good and sufficient foundations. The walls above the foundations to be 21 inches thick, with good common walling carried up to the height required, as shown in the plan, elevation, and sections. A proper bond stone to be laid through the full thickness of the wall every superficial yard (measuring on the face of the wall), and the face of the external walls to be well pointed. The coins for all the external angles of the walls to be scappled, jointed, and set; and to be 20 inches long, 12 inches deep, and 10 inches thick. Stone heads and sills to be chiseled for all the windows, the frames to be built in with the walls. The external doors to have also stone heads and sills chiseled; the jambs to be built in and out tie, scappled and cheeked; (hammer-dressed, as above explained, with a rebate cut out for the door to shut against,) the in-tie to go through the full thickness of the wall, and to be 12 inches in the head; the out-tie to be 20 inches long, and 10 inches in the head. Iron crooks to be run into stone cheeks while building for the door bands, which the carpenter will provide; the lead to be provided by the mason. The two byres at the west end of the present old farm house to be converted into two hovels, as shown in the drawing. The present slated cart-shed to be lengthened with a new

opening, arched, &c., as shown in the drawing. To build jambs and pillars to all the hovels and cart-sheds, with hewn stone in and out tie both sides, well jointed and set; the stones to be 20 inches long, 12 inches deep, and 10 inches and a half thick, and the space between the pillars to be carried up with good common walling. The arches to have pen stones (arch stones) to go through the full thickness of wall, and not to be less than 10 inches in the head; all the angles of the jambs to be cut off, making a 2-inch chamfer. The barn and straw-house to be flag-paved with flag-stones, $3\frac{1}{2}$ inches thick, dressed and jointed, to be laid on a bed of rubblestones 8 inches thick, broken small; the flags to be bedded in sand, and the joints to be set with lime. To pebble-pave the byres and calf-houses with proper cribstone and saddle (the former, fig. 984, *k*, partitions off the crib; and the latter, *l*, the gutter behind) ditto, as shown in the plans. The cribs to be flagged at bottom. To pebble-pave the new stable, fowl-house, hay-house and pig-houses, with the yards to ditto. The stable to have proper stones mortised, and set for stall-posts. To pebble-pave a causeway 4 feet broad, with proper edge stones, in front of all the buildings inside the fold; also along the east side of the east wing, as shown by dotted lines on the ground plan. To build walls for the pig-houses, fold walls, stack-yard walls, and crib walls, as shown in the plan. Proper stone gateposts to be set into the ground, and those for the folds and stack-yard to have iron crooks run into the same with lead, for gates to be hung on; the whole to have scappled coins at the angles and gate openings. The walls to be carried up 5 feet and a half high above the ground, in common walling, with sloped coping. The ridge stone to be worked fair to a moulding, and laid on all the ridges and hips of the roofing. The first stone of each hip to be fixed with an iron spike. Stone water-tables to be laid on the pig-house gables; the first stone to be run into a corbel coin. The stone spouts to be wrought, and fixed into the walls of the pig-yards. The crib walls in the folds to have stone posts grooved to receive deal fronts, and to be flagged at bottom with common flags. The old cottage at Hallington Hill to be taken down; the byre to be converted into a cottage, and the barn into a hovel, opening into ditto. The latter to have jambs carried up with hewn stone and arch, as described for the other hovels. The chimney and fireplace in the cottage to be done as hereafter described for the new cottages. The flagging and plastering also to be the same. The walls for the fold and stack-yard to be done as before described for those at the farm house.

984



988. *Cottages.* To build two cottages adjoining the cart-shed, as shown in the drawing. The walls to be as before described. The chimneys to be carried up with proper vents 14 feet by 10 feet, and to be well pargeted inside with hair and lime; each to have hewn stone jambs, mantels, and chimney-top. The fireplaces to have each a cylinder oven, 15 inches in diameter; a furnace pot to contain eight gallons of water; and a pair (front and bottom bars) of common grates 17 inches wide: the whole to be set with hewn stone fronts, fire bricks, and dampers. The floors to be flag-paved with $3\frac{1}{2}$-inch flags, dressed and jointed, and well bedded in sand.

989. *Plasterer's Work.* To plaster the cottages with two-coated plastering; the stoothing partitions of the dairy and lobby, in the new cottages, to be plastered with two coats of lath plaster. The granary and barn walls to be plastered with one coat wall plaster, 4 feet from the floor. The window-frames to be drawn about (pointed) with hair and lime mortar on both sides. The lime to be well prepared for all the plastering, and to be mixed with a sufficient quantity of hair. The mason to cut all holes for posts, iron crooks, grooves, and all others necessary for carpenter's and joiner's work, and the slating also; to clear away all the surplus earth from the inside of all the buildings, which are to be made level; the earth to be wheeled out to a considerable distance for carting away. The mason, also, to provide lead for running the ironwork into the stone; and to have the use of roofing timber, or any other old timber which may be spared, for scaffolding; but in case any of the same should thereby be broken or injured, to replace them, or else allow the value thereof to the carpenter for damages.

990. *The Carpenter's and Joiner's Work.* To provide and cut all the lintels for the doors and windows, of such scantlings as are hereafter specified; and so as not to have less than 12 inches hold on the wall at each end. The granary above the straw-house to have joisting laid 18 inches apart, mid and mid; and to have 12 inches hold on the wall at each end. — Flooring. The granary floor to be laid with inch-and-quarter white-wood battens, dressed and jointed: the battens to be laid loose, so as to take up and relay after pining (shrinking). The roofing for all the buildings to be framed and hipped, as shown in the drawing, with tie-beams laid on raising plates (wall plates), the scantlings to be hereafter specified; and the whole to have a sufficient number of principals to make the openings between not exceed from 7 to 8 feet. — Scantlings. Tie-beams, 6 inches and a half by 4 inches; principal rafters, 8 inches and a half by 2 inches

and a half; hip rafters, 10 inches by two inches; common rafters, 3 inches by 2 inches and a half, not to exceed 18 inches apart middle and middle; binders (tie beams) 8 inches by 2 inches and a half; ribs, 6 inches by 3 inches and a quarter; ridge, 3 inches and a quarter by 3 inches and a quarter; granary joists, 10 inches by 2 inches and a half; raising plates, 6 inches by 1 inch and a half; lintels, 4 inches thick by the breadth required for the low buildings. The lintels for the granary windows, 3 feet and a half by the breadth required. Hinder posts to stalls, 5 inches by 5 inches; fore posts, 5 inches by 3 inches. Sarking of five-eighths-inch deal, 9 inches broad, to be laid on the eaves and ridges of the roofing on each side. Gutter boards to the valleys to be laid with three-quarters-inch deal, covered with sheet lead, 18 inches broad, 6 pounds to the foot, which is to be provided, and laid at the carpenter's expense. — The stable to be fitted up with stalls, as shown on the plan and section. The stall partitions to be fitted up with inch-and-quarter deal, and to have a 9-inch batten placed horizontally about the middle of each side. The top and bottom rail, 4 inches by 3 inches and a quarter, to be grooved to receive the same. The rails to be tenoned into the stall posts; and the stall posts to be set into proper stones at the bottom, and fixed to girding pieces at top, 5 inches by 3 inches, nailed to the under side of the tie-beams. The hinder posts to be fixed at the top with a screw bolt. Mangers to be fixed between the stall partitions, with fronts and bottoms of inch-and-half deal; the back to be of inch-and-quarter, and the fronts to have a roller 2 inches and a quarter in diameter, grooved and fixed: each manger to have a wrought-iron ring and staple fixed. The hay-racks to be made 2 feet and a half wide; the rungs (spokes) of 1 inch and a half deal; the rack sides, 3 inches and a half by 3 inches; a harness rail 12 feet long, with proper pins, to be fixed in the stables. — The cow-byres to be fitted up with partitions and stakes, as shown in the drawing. The partitions to be cleaded (clothed) with inch-and-quarter deal, and proper posts of the old materials, provided any of them can be found suitable. The stakes to be let into the cribstones at bottom, and to be fixed at the top to joists, 8 inches by 4 inches, laid through for that purpose. — The calf-house to be fitted up with pens, as shown in the drawing; and the partitions to be formed with posts and rails, and paled. The posts to be 3 inches and a quarter square, let into stones at bottom, and fixed to a joist at top, laid through for that purpose. The partitions to have three rails in height, 3 inches by 1 inch and a quarter. The pales to be 4 feet high, 2 inches and a half by three quarters of an inch, and to be well nailed to the rails; each pen to have a small wicket, hung with small bands and crooks, and each having a hasp and staple for fastening. — Doors. All the outside doors of the farmery to be battened of inch-and-quarter deal, grooved and tongued. The barn and straw-house ditto to be hung in two halves. The whole to be hung with bands and crooks, run into stone cheeks. To provide and fix on the same a common wrought-iron sneck (latch), fig. 985, and catch, with ring handle to hang down. The barn, straw-house, granary, and stable doors all to have stock locks of the value of *5s. 6d.* each, and proper iron bolts and staples to be supplied for all the other doors. The cottage outside doors to have each a thumb sneck and catch, and a stock lock of the value of *4s.* The cottage inside doors to be made of 1-inch deal, battened, grooved and tongued, and hung on frames with 3 bands; and each to have a Norfolk latchet. The stable door to be hung in the middle with strap hinges, to allow the door to fall back against the wall. The door between the straw-house and barn to be of 1-inch deal, battened, grooved, and tongued; hung on frames with 7 bands, 22 inches long, and to have a sneck the same as the stable doors, with an iron bolt and staples. — Windows. The cottage windows to be made with casements, and iron bars, forming small panes, about 6 inches by 4 inches, to be fitted into solid frames, leaded and rabbeted; 4 feet three quarters of an inch by 3 feet 7 inches inside of frames; scantling of frame, 3 inches and a half by 3 feet: one casement in each to be made to slide. The above to have outside shutters of three-quarters-inch deal, grooved and tongued, hung on frames with small bands and crooks. Each window to have an iron cotteral (a spring wedge, fig. 986) and an iron turn (a fastening, see Index) to keep it back. The small windows for the cottage dairies to be made with inside sliding trellises, 22 inches square. The windows for the stable, granary, and foal-house to be made 3 feet high, 2 feet 10 inches wide; and to have inside sliding trellis frames, 3 inches by 2 inches and a half. The stoothing partition and ragglings to be fitted up so as to form a dairy and lobby in the cottages, with door-frames for ditto, 4 inches by 3 inches; and stoothings, 2 inches and a half by 2 inches and a half. The dairies to be shelved, with two shelves in height, each 12 inches broad, of inch-and-quarter deal, with brackets. The cottage windows to have inch-and-quarter deal bottoms, and 1-inch deal backs. The jambs and heads of the doors and

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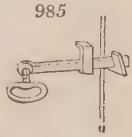

986

windows to have a three-quarters-inch angle bead for plastering. A chimney shelf of 1-inch deal, with brackets, to be fixed above the fireplace in each of the cottages. The windows in the granary to have inch-and-quarter deal bottoms, to project 1 inch over the wall, and to be nailed to the window sill. — The hay-racks to be the same as those in the stable, and to be fixed in each hovel the full length; as are the rack and manger in the foal-house. The hovel at Hallington Hill to have a partition put across it with posts and rails; and the gates to be hung with loops and crooks for young cattle. The stairs in the straw-house to be fitted up with inch-and-quarter deal steps and risers, and proper strings: the stairs to be partitioned off with stoothings, and three-quarters-inch deal cleading next to the straw-house; with inch-and-quarter battened door at the bottom, hung on frames 4 inches by 3 inches and a quarter, with T bands, and to have a stock lock and sneck as before described. A rail to be fixed round the opening of the granary stalls, with skirting at the bottom of three-quarters-inch deal, 12 inches broad. The skirting to be fixed round the barn and granary of 1-inch deal, 4 inches and a half broad, and to be well nailed to plugs. — Gates. Nine gates to be made for the folds and stack-yards, including those at Hallington Hill. Each to have 5 bars, and to be braced. The bars to be 4 inches by 1 inch and a half, and the stiles to be 4 inches and a half by 3 inches and a half. Also, 5 wickets, with 5 bars and braces, for the inside of the folds, &c. &c. The bars to be 3 inches and a half by 1 inch and a quarter; and the stiles, 3 inches and a half by 3 inches. The whole to be hung with proper iron loops, and crooks run into stone posts, in the coins of walls, where necessary; and to have proper hasps and staples. Crib-boards to be fixed in all the stone cribs in the folds; to be 10 inches broad, and 2 inches and a quarter thick; and to be made to take out and in by grooves cut in the stone posts. Centres for the arches of the hovels and cart-shed to be provided, and posts for setting ditto.

991. *Smith's Work, and Hardware.* To provide and fix all spikes, nails, screws, &c., necessary for the carpenter's and joiner's work; and all the other hardware and smith's work before specified.

992. *Slater's Work.* To cover the roofs of all the buildings of the farm offices, as shown on the plan, with slates of the same kind, and done precisely in the same manner, as before specified for slating the dwelling-houses.

993. *Glazier's and Painter's Work.* To glaze the casements of the cottage windows with second crown glass; the panes to be 6 inches by 4 inches, neatly puttied on each side, and the casements to be primed before glazing. (N.B. The casements will be provided; and are, therefore, not to be estimated. To paint all the external doors and frames; also, the granary windows, the cottage ditto, and the stable ditto; also, the inside doors of cottages, and the window backs, with two coats of white lead and oil, on both sides. The windows to have one coat before being built into the walls.)

994. *All the Works*, as before specified, to be done in a sound and workmanlike manner, subject to the approbation of Mr. John Green, Architect, or whom he may appoint to inspect the same; and it is to be understood that, should it be deemed advisable that any of the work before specified, for the dwelling-house or farm offices, should be dispensed with during the progress of the building, the value of such work is to be deducted from the amount of the contract; and, on the other hand, should any alteration or additional work be required, which is neither expressed nor understood by the plans and foregoing specification, the expense of such alteration or additional work is to be paid to the contractor, and agreed for previously to its being done, or else left to the valuation of the inspector. (N.B. The iron-barred casements for the cottage windows will be provided; therefore the joiner need only estimate for the outside frames for ditto, as specified.)

995. *General Estimate.* The following form was sent us with the foregoing specification: —

	£	s.	d.
Building new farm-house, fig. 977, *a*, *b*, *c*, *d*	453	12	7
Building corn-barn, *m*	95	11	2
Building straw-house with granary above, *b*	125	3	1
Building foal-house, *p*; two cow-byres, *q q*; and calf-house, *r*	176	6	8
Building two stables, *h* and *o*; and a hay-house, *i*	189	3	10
Building one hovel, *k*	48	13	11
Building two cottages, *u u*	130	8	0

We have formed a rough estimate of the cubic contents of the farm house, which, we find, contains 31,570 feet, which gives about 3½*d.* per foot as the price of this description of building in Northumberland. The cottages estimated in the same manner cost 2¾*d.* the cubic foot; and the farm buildings 2*d.* These prices are not much more than half what such farm houses and farmeries would cost in the neighbourhood of London,

as will be evident by comparing them with the estimate of the Bury Hill Designs, § 863 and § 880. One reason of this is, that in Northumberland stone is got for the working, and the carriage of the greater part of the materials is found by the tenant.

996. *Remarks.* This Design is another of those so obligingly furnished us by John Green, Esq., of Newcastle, the first Architect, as we are informed, for farm buildings, in the extensive counties of Northumberland and Durham. It is one of twenty plans and estimates which he made, in the year 1824, for renovating the farm buildings and cottages on the estate of Beaufront, lying on the river Tyne, between Newcastle and Hexham. By the advice of a kind friend, in the north of the county, we applied to this gentleman through our esteemed correspondent Mr. Falla, the eminent nurseryman at Gateshead, near Newcastle, and he has liberally permitted us to examine many of the plans (accompanied by their specifications and estimates) which he has designed and executed on different estates. From these we have selected seven, of which this is the last, and they will give a complete idea to the Architect of the mode of arranging farm houses, farmeries, and the dwellings of farm labourers, in that first of all English agricultural counties, Northumberland. We must say, that, highly gratified as we have been with these farm houses and farmeries, we have been proportionately shocked by the scanty accommodation provided for the farm labourers. While the master is lodged in a house which is fit for any gentleman of independent fortune, and the horses and cattle have as ample accommodation as can be desired, the poor ploughman and hind are put into single rooms, each generally about 22 feet long by 16 feet wide, with one door and two small windows. At one end of this room a closet or dairy, 5 feet by 5 feet, is partitioned off, and lighted by one of the windows; and a corresponding space serves as a sort of lobby to the outer door. This reduces the room to 16 feet by 16½ feet, which must serve the occupant for every purpose to which a dwelling-house can be applied. The reader may turn to the plan of two of these cottages, marked *u u*, in fig. 973, p. 487, which he may rest assured are fac similes of all the cottages built in Northumberland for ploughmen and farm-labourers. Among Mr. Green's plans, we have met with none with two rooms; and only with two or three that have privies or places for a pig. These last cottages, we are informed by Mr. Green, were built for labourers to be employed by the landlord in different parts of his estate. To the cottages marked *u u*, in fig. 973, there is attached no privy or exterior appendage whatever; though this is not much to be wondered at, since there is none to the farm house. We are tempted to enquire by what strange circumstance it happens that the art of farming should be carried to such a degree of perfection as it is in Northumberland, while the farmers, and more especially their servants, live in a state of comparative destitution of many of the comforts enjoyed by the same class in the south of England, where the art of agriculture is at the lowest ebb; and we can only account for it from the general ignorance both of the labourers and their employers, and from the remaining habits engendered by the oppression of the feudal system. The truth is, that almost the entire produce of the land, beyond the mere subsistence of the farmer and the labourer, is paid to the landlord in the form of rent; because the landed capitalists, like the great capitalists in trade and manufactures, enjoy a complete monopoly of the market, and they can command their own price for their land, as the others do for the use of their capital. Thus, in the country of great landholders, in the same manner as in the great manufacturing districts, the operative is scarcely able to exist. This evil can only be remedied by time, and a better system of government, which will effect a more equal distribution of land and capital. In submitting these remarks to the reader, we intend to make no reflections, in this or in any other case, on the Architect, who must necessarily conform to the customs of his locality; but we conceive it to be the duty of an author, who is under no local influence, to express his opinion freely on this, as on every other subject that comes within the range of his work. We may add, that the chief point in which the farmeries of Northumberland excel those of Scotland, is in the subdivision of the fold-yards into smaller yards; which, instead of being mere manufactories for manure, serve as enclosures for the growth, improvement, or fattening of cattle. Weak and young cattle always suffer much when many are placed together in the same yard; and this, more especially, when the animals are brought from mountainous or partially enclosed districts; or even districts where the enclosures are very large. Cattle fed loose in small enlosures or hammels of this kind have their hair sleek and unbroken, and their feet are never so tender as to prevent their travelling some distance to market. Nine tenths of the beeves or young cattle of Northumberland, we are informed by one of the most intelligent farmers in the county, are fed in small fold-yards, such as are represented in the ten preceding Designs, to the number of from three to six, or even more, together, accordingly as they are found to agree. In the rich flat pastures of Lincolnshire, Leicestershire, and other counties of England, the larger breed of cattle, from their constitutional tameness and docility, will

fatten together in large open yards, by dozens; but this is not the case with Scotch cattle, more especially those from the Highlands. In looking over the specification, § 979 to § 995, the reader will observe that many of the building terms used in Northumberland differ from those in use about London; and some even from those employed in the south of Scotland, as given by Mr. Newall in his specification, § 907. We have shortly explained these terms, each when it first occurs; but there are some of them which will require to be more minutely defined, and compared with other local terms, in the Glossarial Index. This specification will be found of great use to all persons intending to build farmeries where stone is employed, and it also shows the practical man what is considered, in a highly cultivated district, the best mode of finishing racks, mangers, cribs, partitions, &c. The construction of the cribs is worthy of notice; the sides and bottom are formed of boards two inches and a quarter thick, which fit into grooves and notches in stone posts. This seems an excellent plan, because the boards may be taken out at any time, and cleaned, and at seasons when the cattle are not kept in the yards they may be taken out altogether, and placed under cover, in a dry airy situation, till again wanted. All the stables are fitted up with stalls and full-length partitions, so that every horse securely enjoys the food placed before him. There appear to be a few inches of slope from the head of the stall to the gutter behind, which is now generally disapproved of in the best stables in England and France, though still continued in the farm stables in Scotland, as appears by an article in the *Highland Society's Transactions*.

Design XXII. — *The Farmery at Calley in Kirkcudbrightshire, suitable for a Galloway Crop and Pasture Farm of* 400 *Acres.*

997. *The Object* of this Design is to afford accommodation for wintering young cattle, and fattening others, as much or more than for affording stable room for horses. In Galloway, we are informed by the contributor of this Design, Mr. Brown, the factor or land agent at Calley, that the half of the rents is generally paid from the corn crop, and the other half from black cattle; so that a considerable proportion of the farmery is required to be laid out as cattle-sheds, for wintering the animals when young. The oldest and best Galloway cattle are generally wintered in the fields; which, in Galloway, where the winters are very temperate, are mostly well sheltered by hedges and plantations. Cattle wintered in this way are less tender in the feet, have a finer skin in the spring, and are in better condition to go to the English markets at that season, than those wintered in sheds and yards.

998. *Accommodation.* The cattle sheds here shown at *a*, in fig. 987, with the yard in front, *b*, are sufficient for the accommodation of forty or fifty-two head of cattle. There are a feeding-house, *c*, in which six cattle may be fed in stalls; a cow-house, *d*, 32 feet long, in which ten Galloway cows may stand without stalls; and at their heads there is a foddering-passage, *e*, which communicates with the straw-house, *f*, the feeding-house, *c*, and the cattle-sheds and yard, *a*, *b*. There are a barn, *g*, with a threshing-machine driven by water; a room for horses' corn and cut straw, *h*; a stable, 33 feet by 17 feet, for six horses, *i*; a cart-shed with a loft over, *k*; a small office or counting-house, *l*; a boiling or steaming house, *m*; and a tool-house with a smith's forge for occasional use, *n*. One part of the yard is left open,

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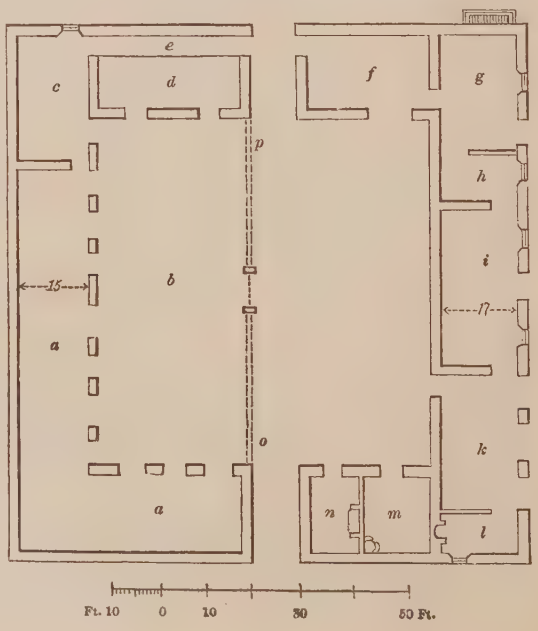

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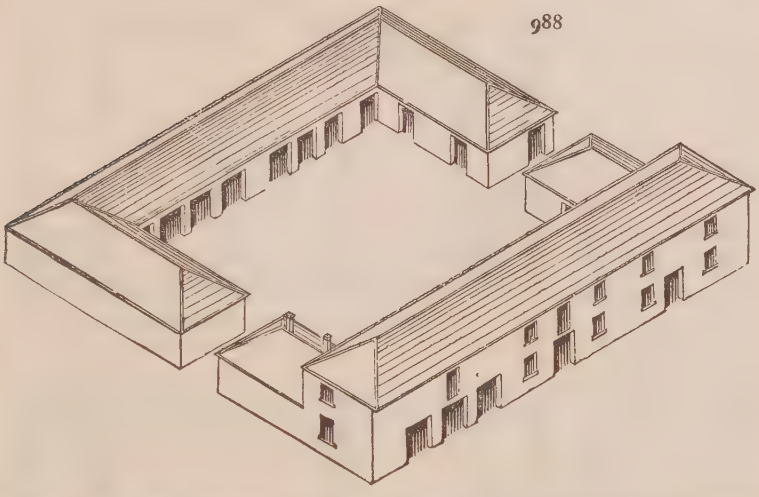

and the other part is enclosed by a fence of pales, *o*, *p*, as a fold for the wintering of cattle. The general appearance of this Design is shown in the isometrical view, fig. 988.

999. *Construction.* The walls are chiefly of the slate-stone of the country, a cold and disagreeable stone for cottages and human dwellings, but less injurious for buildings for cattle and for sheds. The roofs are of Baltic fir, covered with slates; a covering cold in winter, and too warm in summer; and therefore, however fit for sheds, not to be commended for stables without lofts, or for cattle-houses. It is true that the prevailing prejudice, in the west of Scotland, is in favour of slates indiscriminately, from their durability; but even if thatch should be found less durable, and this is not always the case with the thatch composed of chips, shavings, and spray, or heath, we consider the latter as decidedly preferable for all buildings in which animals are to be lodged. But, in Galloway, improvement is not yet so general, that long heath and broom cannot be found; and these, even the natives will allow, are nearly as durable as any slate or tile whatever; or, at all events, they are sufficiently so for constructions which are undergoing the progressive improvements and changes which those of agriculture constantly are.

1000. *Remarks.* This Design has been furnished us by one of the most enlightened agriculturists in the west of Scotland, and therefore it may be considered as a fair specimen of a farmery for the agriculture of that district. It would be easy to add a farm house; but we have given so many good plans of this description of dwelling, that we consider it unnecessary to add one on the present occasion. No arrangement for the collection of liquid manure is shown; because the farmers of Galloway, as those of most other districts of Scotland, have not yet arrived at that degree of scientific refinement to be fully aware of the advantages to be obtained by this important part of a perfect farmery.

Design XXIII. — *A Farmery for a small French Farm, as given by Morel-Vindé.*

1001. *The requisite Farm Buildings for a small Farm,* our author observes, are the same as for a large one, almost the only difference being in their magnitude. The plan exhibited in the following figures is therefore to be considered as conveying the rudimental idea of all farmeries whatever, where the objects of cultivation are those common to the temperate regions of both hemispheres. The same constructions, which in the annexed plans are only a width of two bays of ten feet each, by forty feet in length, might be extended to many bays of the same size. The following is the general type of this building: — 1. The stable and cow-house are in the same space without separation; because by this arrangement, on small farms where there are few or no servants and not much litter, the animals are more easily looked after; the litter from the horses is with little trouble thrown under the cows, and the dung of both, being mixed, produces a better manure. 2. The poultry-house is placed alongside of the cow-house, and only separated from it by an open grating in order to admit the heat of the former to the latter. 3. The barn is sufficiently large for containing one rick of 3000 sheaves, with additional

space, in order that a part of it may be used, if necessary, as a cider-house, for wine vats, or for storing roots. The space covered by the entire building is eight hundred superficial feet.

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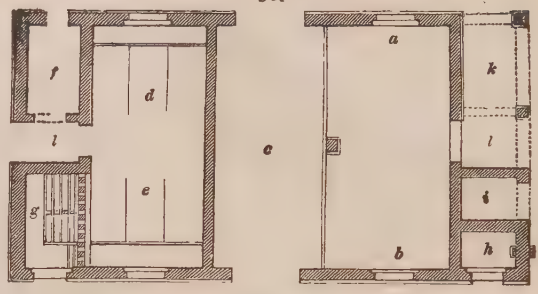

1002. *Details.* Fig. 989 is the surface ground plan, showing the barn for unthreshed corn, *a*; the cellar end of the same barn, *b*; the threshing-floor, *c*; the stable for three horses, *d*; cow-house for three cows, *e*; harness-house and general magazine, *f*; poultry-house, *g*; pigsty, *h*; place for hatching poultry, *i*; open shed for large implements, *k*; and two porches, *l l*. Fig. 990 is a plan of the foundations. Fig. 991 is a plan of the flooring over the barn, stable, &c., which is used for containing unthreshed corn. Fig. 992 is the side elevation showing the door of the porch. Fig. 993 is the elevation of either of the ends. Fig. 994 is a longitudinal section; and fig. 995 is a perspective view.

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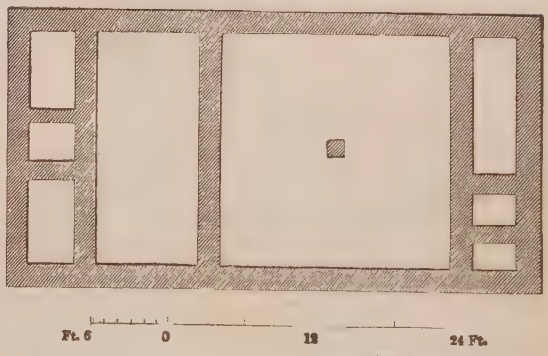

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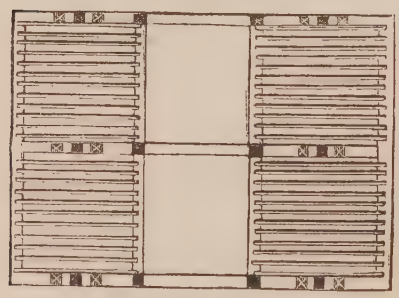

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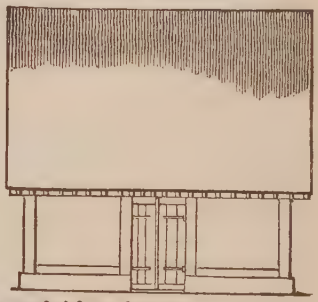

1003. *Construction.* The foundations are of stone or brick, and the superstructure is framed of timber, in lengths not exceeding twelve feet, and not measuring more than

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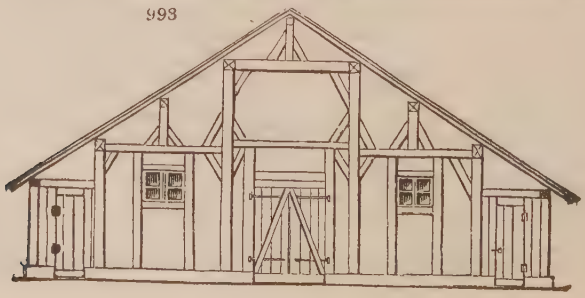

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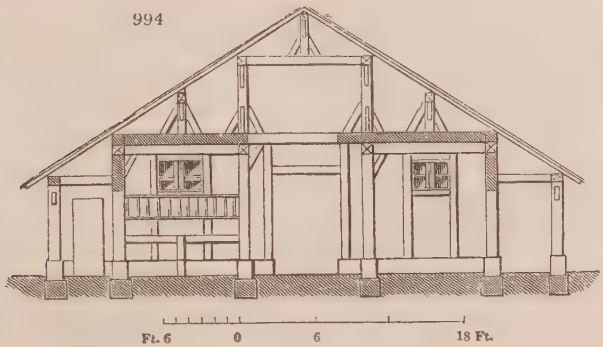

six inches on the side. The panels are filled in with studwork or quartering, and covered with weatherboarding or plaster.

1004. *General Estimate.* The actual cost, in the neighbourhood of Paris, was £150; that for the departments of France, £92. A bay may be added, in the neighbourhood of Paris, for £42; and in the departments, for £25.

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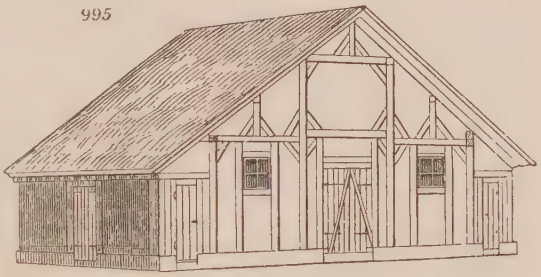

1005. *Remarks.* The great economy of this construction must be obvious. This economy results from the four cross walls being used on both sides; and from two short lines of eaves serving for the whole structure. To be convinced of this, it is only necessary to imagine the threshing-floor, corn-bay, stable, cow-house, the two implement-houses, the two poultry-places, and the pigsty, arranged as separate buildings round a square or parallelogram farm-yard, as in Britain. Add to this, the great advantage of the accumulation of heat during winter, and the exclusion of heat during summer. The steepness of the roof not only renders that part of the structure more durable, by preventing it from ever being soaked with moisture, but it actually reflects off the heat more powerfully in summer, and receives it more effectually, because at a larger angle, during winter. If eaves-gutters are considered necessary, they are only required at the two ends, and even the tubes for conducting the water from these gutters to the ground are as short as it is possible to conceive them to be. We have examined all the French and German works on Rural Architecture, and though we have found much to approve of in Lasteyrie's *Rural Architecture* and the *Landes Verschönerung*, published periodically at Munich, which, through the kindness of our friend Count Hazzi, we receive regularly, we have found nothing at all worthy of being put in competition with the *Architecture Rurale* of Morel-Vindé. We say this with the more confidence, having seen most, or all (for we cannot bear all the circumstances exactly in our mind), of his designs in actual execution, on his own beautiful estate, at Celle, in 1828. — In a wine or cider country, or on a farm where potatoes were raised in great quantities, a cellar might be made both under the threshing-floor and the bay for unthreshed corn. The two porches convey an idea of shelter and comfort, and, in fact, produce both in every building to which they are judiciously attached. We particularly recommend this Design to our American and Australian readers, and, indeed, to those of all countries where timber is the principal building material.

Design XXIV. — *A Farm House and Farmery suitable for a Farm of from Three Hundred to Five Hundred Acres in France.*

1006. *The object* of the following Design, which is taken from the work of Morel-Vindé, is to show what is considered by one of the first agriculturists in France a model farm

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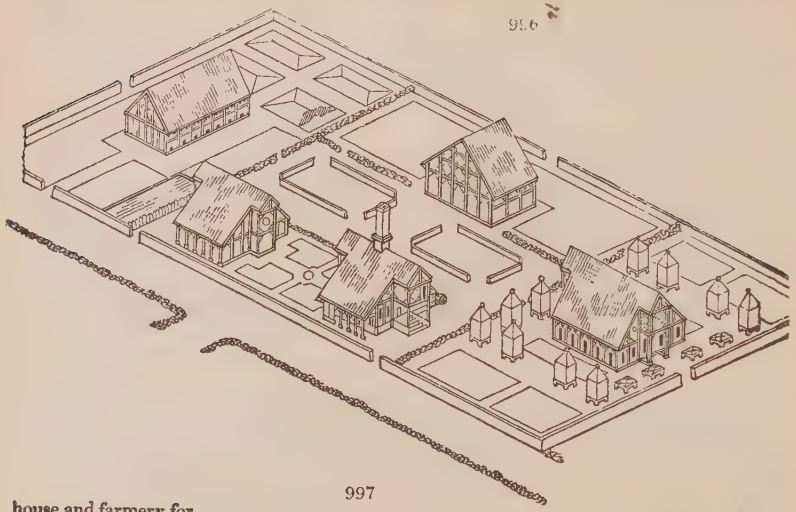

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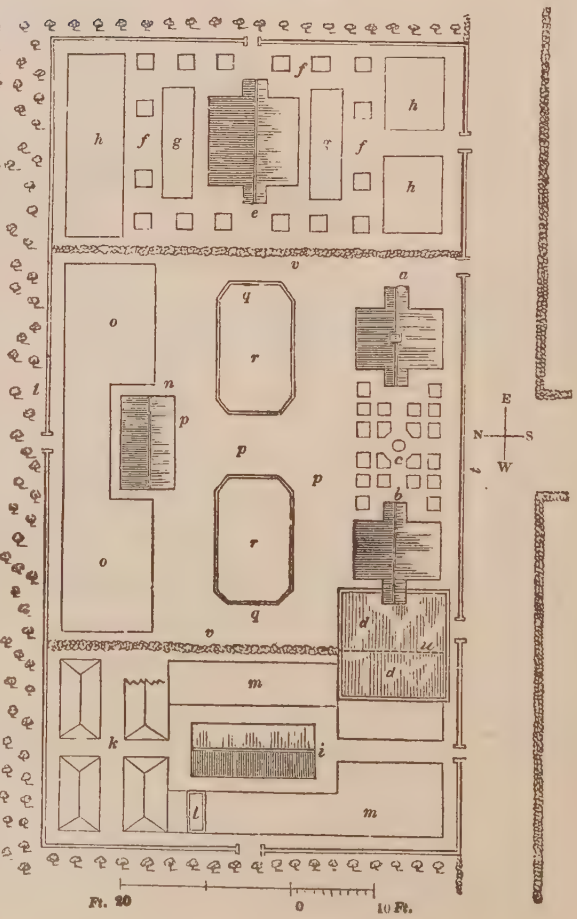

house and farmery for a large farm. Like all Morel-Vindé's designs, it will be found to be the result of much consideration, both in point of arrangement and accommodation, and of economy of construction; altogether it is eminently worthy of imitation, in countries where small timber forms the principal building material.

1007. *General Arrangement.* The farmery with its different courts, yards, and gardens stands on a space of about two acres: the general appearance is as in fig. 996, and fig. 997 is the general ground plan. This plan is arranged in four divisions. In the first may be seen the dwelling-house, *a*; an open shed on posts, *b*, under which linen is washed and dried, and maize, tobacco, onions, herbs, and various other garden productions are hung; the kitchen-garden, *c*; and part of a large pond, *d u*, for supplying water for washing, for watering the gar-

den, &c. The second division contains a large building, including a barn, stable, and cow-house, *e*; stands for ricks, *f*; plots of turf, *g*; and oblongs planted with apple and pear trees for cider and perry, *h*. The third division contains the sheep-house, *i*; four farm compost heaps, *k*; the pit for stercorat, *l*; two plots for cider fruits, *m*; and a part of the pond, *d*, which is divided by a fence, *u*. The fourth division contains the cart and implement shed, with granary over, *n*; a plot planted with fruit trees, *o*; two dung-pits, *r*; and the situations of open gutters, *p p p*, which collect the surface water, and deliver it either into the dung-pits at *q q*, or into the pond, *d*, as may be considered most desirable. These four divisions are surrounded by a wall, *t*; and they are separated from each other by hedges, *v*. The advantage of placing the different buildings which compose the farm house and farmery in four divisions, Morel-Vindé states to be as follows: — the absolute security against the communication of fire from one to another; the facility of maintaining an orderly administration of the business of the farm; and the thriving better of the different kinds of animals, as from their being kept distinct, they will run less risk of being injured by each other. We shall now give the details of each of these divisions.

998

1008. *The Farm House* is a model of excellent contrivance and economy. Its general appearance is shown in fig. 998; and its details, which are given with such distinctness and accuracy that the simplest country carpenter may build from them, are exhibited in figs. 999 to 1008. The plan of the house is formed on the same general model as that detailed in § 742; but it is necessarily larger, in order to afford the additional accommodation required. The living-apartments are raised on four cellars, which give a bake-house and wash-house, a beer and cider cellar, a cabbage or green vegetable cellar, and a cellar for potatoes and other roots. All the living-rooms and bed-rooms for the family are contained on one floor over these cellars; and on the floor above are the bed-room for servants, and a place for drying linen. The only luxury which may be said to distinguish this plan from that

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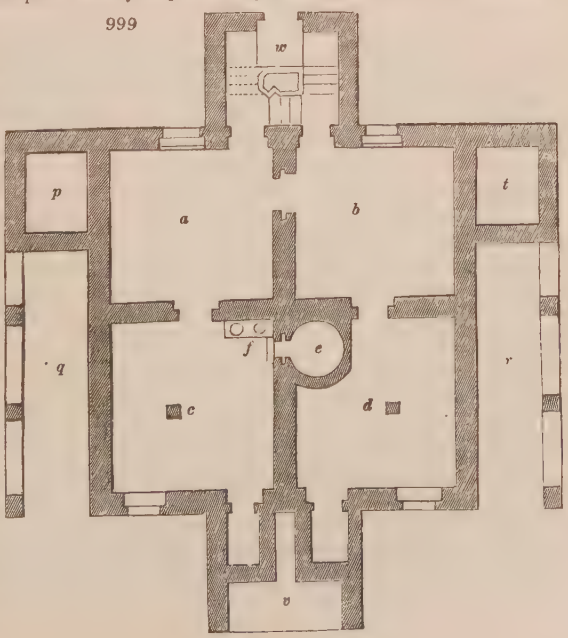

before given is, that there is a bed-room for strangers. Fig. 999 is a plan of the cellar floor, in which *a* is the wine, cider, and beer cellar; *b*, the cabbage or green vegetable cellar; *c*, the bakehouse and wash-house, with a square supporting post; and *d*, the potato-cellar, also with a post. In the bakehouse there are an oven, *e*, and a stove, *f*, which might be employed for heating the whole house. The foundations of the stairs to the principal entrance, and for descending to the cellars, are shown at *v*; those of the back door and staircase at *w*; of a small storehouse or fruit-room at *p*; of the implement-shed at *q*; of the shed for wood at *r*; and of the cesspool of the two privies at *t*. Fig. 1000 is a plan of the principal floor, in which *g* is the kitchen, with its dresser

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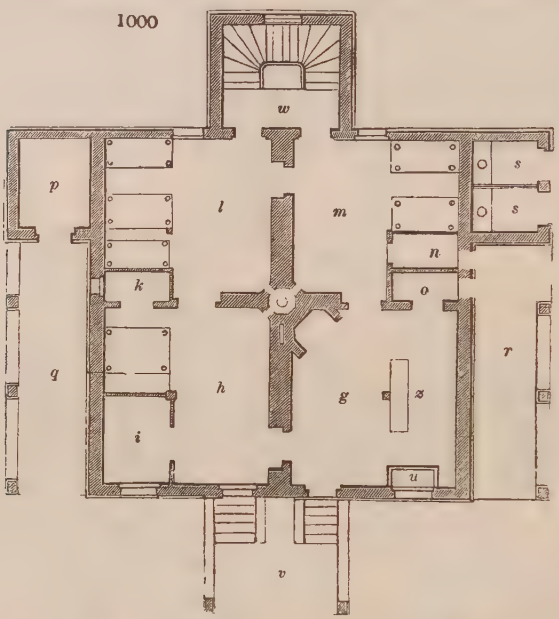

and post, *z*, and sink stone, *u*; *h* is the parlour, with its double-sized or best bed, which in French farm houses is but seldom used, the whole family sleeping together in one large bed-room, *l*; or the master and mistress using the stranger's bed-room, *m*; *i* is the master's office, or place of business, the window of which ought to command the entrance gate to the farmery, and does so in the plan, fig. 997; *k* is a clothes-press, or linen and china closet; *l*, the children's bed-room, and room for sewing-work (*chambre de couture*); *m*, stranger's room; *n*, light closet; *o*, pantry; *p*, fruit-room; *q*, shed for all the agricultural implements used on the farm; *r*, shed for wood and other domestic purposes; *s s*, privies; *v*, entrance porch, with stair down to the cellar and stair up to the kitchen; *w*, staircase to the upper floor. In the centre of the building may be seen the octagonal funnel which receives the heated air from the stove in the cellar, and communicates with the parlour and the two bed-rooms through the lateral openings. Fig. 1001 is a plan of the upper floor, in which are seen the sleeping-room for servants, and general lumber-room, *v*; place for drying linen, *w*; and reserve bed-room, *x*. Fig. 1002 is the plan of the joists of the principal floor. In this plan the situation of the upright posts may be observed, from which it will be evident that neither girders nor joists are required of a greater length than ten feet. Fig. 1003 is an elevation of the entrance front. Fig. 1004 is an elevation of one side, in which may be seen the entrance porch, and stair to the principal floor, *c*, and the projection behind containing the staircase, *d*. Fig. 1005 is a longitudinal section through the bed-rooms, in which may be seen two stoves, *e e*, one in each bed-room; the door of the oven, *f*, and of the ash-pit under it, *g*; the stairs up to the principal floor, *h*, and down to the cellar, *i*; the inside stair to the beer-cellar, *k*; the stair to the principal floor, *l*; and to the floor above, *m*. In showing in what manner this dwelling is but an extension of that detailed in § 742, Morel-Vindé remarks that the kitchen has the addition of a pantry; that the stove in the centre, which ought to warm, dry, and ventilate the whole house, is enlarged in proportion to the dimensions of the rooms which it has to heat; and that the air which supplies combustion in this stove,

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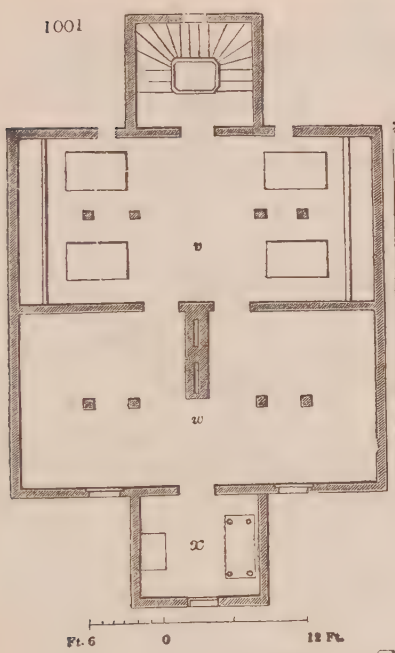

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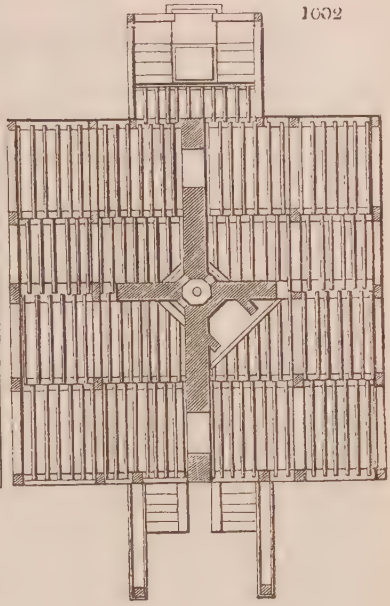

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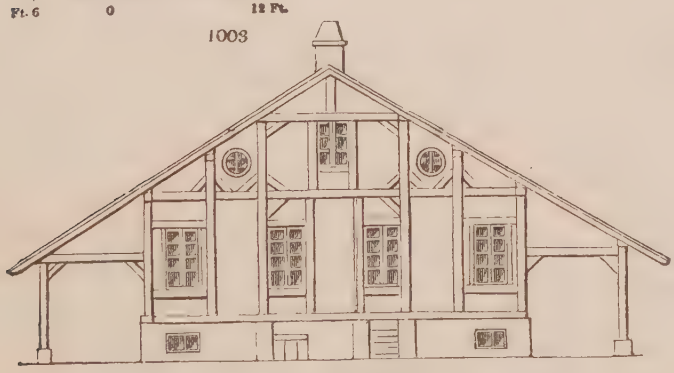

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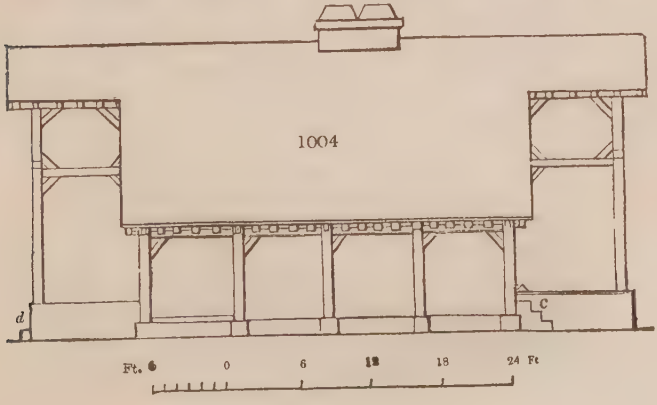

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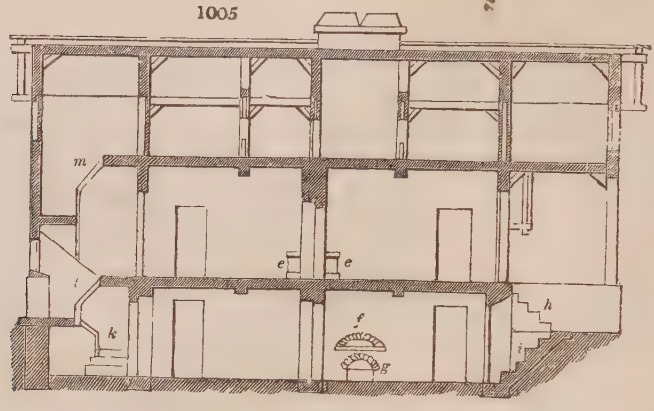

must always be drawn from the exterior, which it will be, if the bakehouse door does not fit very accurately, or if the window be left partially open. Instead of the ladder for ascending to the garret in the smaller house, we have here a staircase; and the garret, which in the smaller house was intended chiefly as a granary, has now a ceiling and boarded sides, and forms a servants' room, a room for drying linen, and the reserve bed-room.

1009. *Estimate.* This building, with its two porches and sheds, covers 1580 superficial feet; and it costs, at Paris, £546: 15*s.*: 10*d.*; or, in the departments, £328: 2*s.*: 6*d.* As the cubic contents of the buildings amount to 25,280 feet, it thus appears that 5*d.* per cubic foot is something near the rate from which to form an estimate for this description of farm houses in the neighbourhood of Paris, and 3*d.* in the provinces.

1010. *Remarks on the Dwelling-house.* A superficial observer, deeply imbued with the prejudices common in Britain, and especially in Scotland and other stone countries, against wooden buildings, and not taking into consideration the fitness of means to ends, will be apt to despise the simplicity and homeliness of this farm house; but to us, who have entered into all the details of this Design, it appears perfect of its kind. The accommodation is ample for the country and state of society for which it is designed; and it is contained in a form as near as practicable to that of a cube. The mode of heating is the most perfect that could be devised; and the room for drying linen is a great source of comfort to the housewife, in rainy weather or in the winter season. It may be thought that there are too few bed-rooms, and too many beds in one room; and the bed in the parlour will no doubt appear shocking in the eyes of an Englishwoman. It should be recollected, however, that the manners of the French are materially different from ours in this respect; and that, with apparently less delicacy, they have not less moral rectitude. Whoever has travelled much by the public conveyances in either France, Germany, or Italy, must have frequently found himself going to bed in the same room with strangers of different sexes.

1011. *The Barn, Stable, Cow-house, Calf-house, Dairy, Cheese-room, Poultry-house, Pigeon-house, Piggery, &c.*, for this large French farm, are all contained in the same building. The problem to be solved is, to unite under the same roof, at the least cost, and in the manner in every respect the most suitable, a stable for twelve horses, a cow-house for as many cows or cattle, a calf-house, a dairy, a cheese-room, a poultry-house, piggeries, a harness-room, and pigeon-houses, with a barn sufficiently large for containing 6000 sheaves of grain at a time, and with two threshing-floors for threshing it. This

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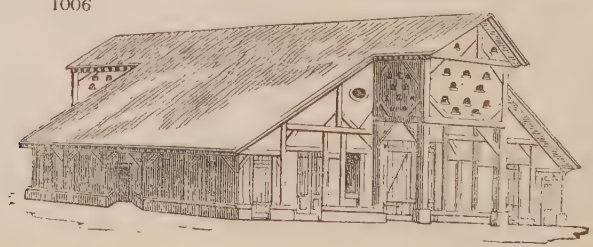

problem is solved in the plan, fig. 1007, which presents the best possible construction of each particular requisite, and the best mode of uniting them together at the least possible expense. Fig. 1006 shows the general appearance of this building, and fig. 1007 its ground plan. The latter contains a barn with two threshing-floors: one for wheat and rye, *a*; and another for oats, peas, and barley, *c*; with a space for either straw or unthreshed corn between them; the corn being either brought in from the ricks in small quantities, as wanted to be threshed, and the straw piled up; or in entire ricks, and threshed by degrees as the straw is consumed in the stable, cow-house, &c.; *b* and *d* are porches, over which are pigeon-houses; *e* is a stable for twelve horses, fitted up with separate stalls, and a rack and manger; *f* is a cow-house for twelve cows, with separate stalls, and a manger, but

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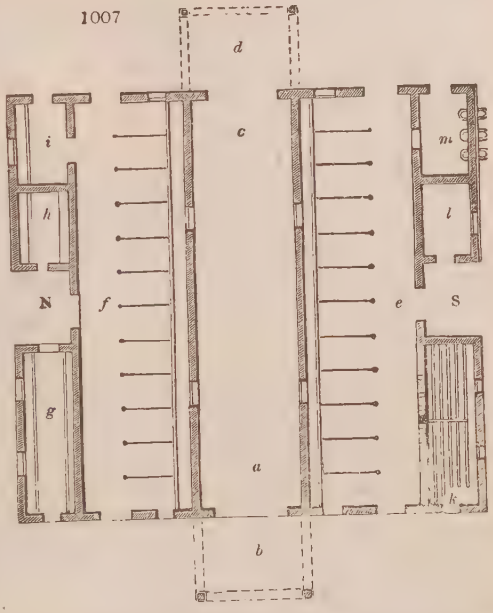

no rack, for reasons given § 757; *g* is a dairy with two windows to the north, and two doors to the east and west; *h* is a cheese-room; *i*, a calf-house; *k*, a poultry-house, grated on the side next the stable, with a view of admitting to it the heat from the horses; *l*, a harness-room; and *m*, piggeries. There is a lobby to the north at N, and another to the south at S. Fig. 1008 is a plan of the foundations. Fig. 1009 is a plan of the flooring over the

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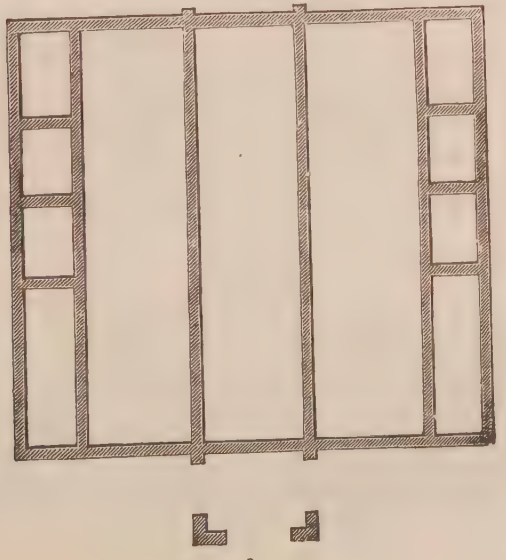

stables, cow-houses, and porch; the threshing-floor being left open to the roof. Fig. 1010 is an end elevation. Fig. 1011 is a cross section. Fig. 1012 is a longitudinal elevation. Fig. 1013 is a longitudinal section through the threshing-floor. Fig. 1014 is an elevation of the racks and mangers of the stable; and fig. 1015 a section, showing the construction of the rack and manger. Figs. 1016 and 1017 contain an elevation and section of the feeding-trough in the cow-house.

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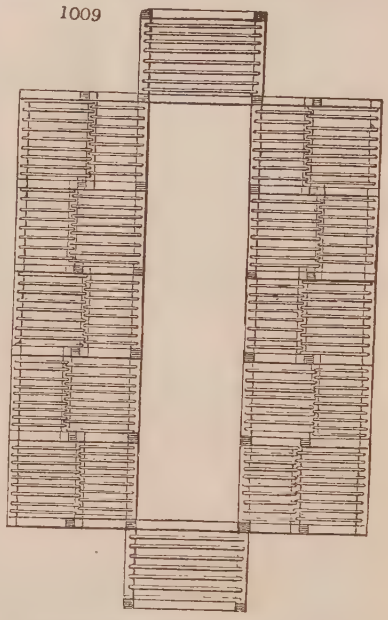

1012. *Estimate.* The actual cost of this building, in the neighbourhood of Paris was £438: 17*s.*: 8*d.*; and the price for the departments of France is £263: 5*s.* As the cubic contents of the building are 24,052 feet, this gives $4\frac{3}{4}d.$ per foot as a fair price for estimating this description of building in the neighbourhood of Paris, and $2\frac{1}{2}d.$ per foot for estimating it in the provinces.

1013. *Remarks on the Building containing the Barn, Cow-house, &c.* The author observes on this plan, that the greatest care has been taken to adjust every part with a view to sufficient strength and economy. The stables and cow-houses are 14 feet 6 inches wide, and 53 feet long, inside measure; which, he says, is the smallest space that ought to be allowed for 12 horses and 12 cows. The mangers, racks, and troughs are of the proper dimensions, and are placed at the precise heights from the ground at which they ought to be. No racks are placed in the cow-house; because, if they were put sufficiently low, they would only incommode the animal when eating out of the trough; and, if they were placed as high as the racks of horses or nearly so, they would oblige the animal to

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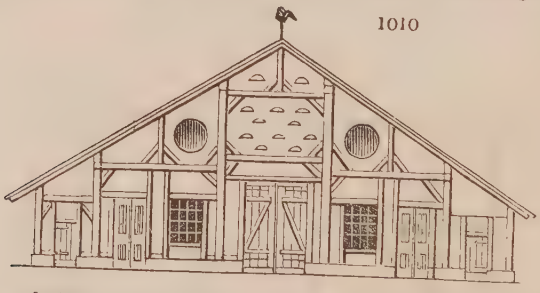

raise its head, and thus endanger abortion. All the doors to the stables and cow-houses are grated, or formed with lufter-boards, in order to admit through them a continual

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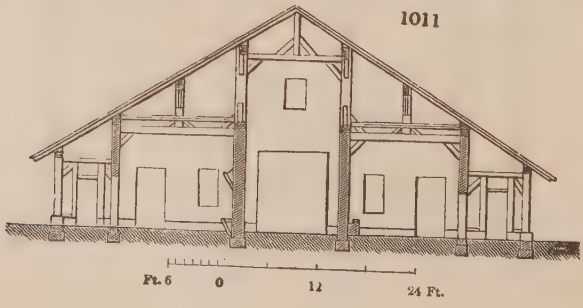

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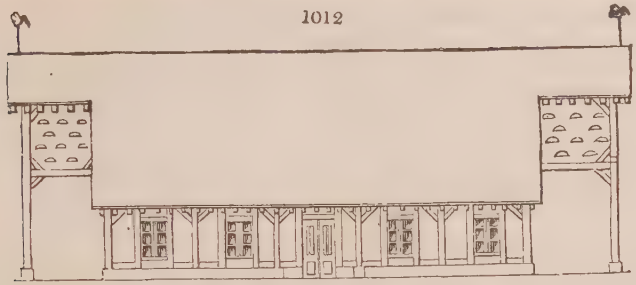

current of air. For the same purpose, and for light, there are four windows to the threshing-floor, and one window at each end of both stable and cow-house, as may be

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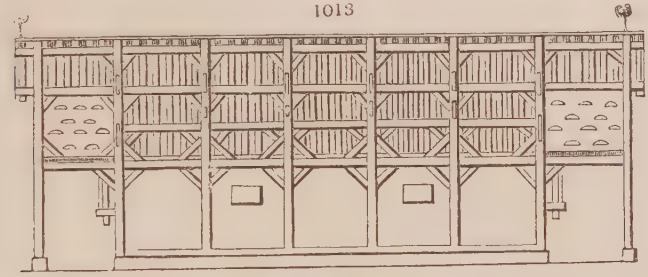

seen in the plan. The partition which separates the poultry-house from the stables is of trellis-work or luffer-boarding, in order that the heat may enter the former, for the

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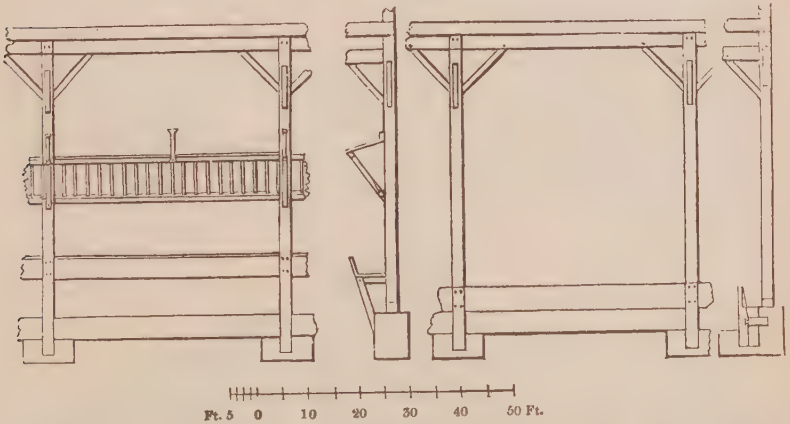

benefit of such hens as are laying eggs. The threshing-floor is 12 feet wide and 50 feet long, which allows a considerable bay for unthreshed sheaves in the middle, and space for two threshers at each of the ends. Over the spaces for the two threshers at the ends, may be floorings of joists for receiving sheaves. The middle of the threshing-floor, the two floors over the stable and the cow-house, exclusive of the spaces over the threshers, will hold two stacks of unthreshed corn, each containing 3000 sheaves (see § 815). The two porches at the two extremities of the threshing-floor are for protecting the latter from the weather; and, at top, one of them contains a pigeon-house for wild or common pigeons, and the other a cot for stockdoves. Morel-Vindé concludes by observing, that, if any one will take the trouble of examining this Design with the most severe attention, he will find that it leaves little to desire, unless the farm were of an extraordinary size. We may add, that in this case the chief addition that would be necessary would be a

threshing-machine, which might be placed at one end of the threshing-floor, and driven either by water, or by a gin-wheel under a porch sufficiently large to cover the horse-course. The building is composed of five bays 10 feet wide by 56 feet long, exclusive of the porches; hence, the expense of the two gable ends being already incurred, any number of additional bays may be introduced, at the sixth part of the first cost of the whole building. By this means the barn, stable, cow-house, &c. may be extended to any degree of accommodation required.

1014. *The Rick-stands* for this farm, which are placed around the barn in the manner shown in fig. 996, have already been described under § 815 and § 816.

1015. *The Cart-shed and Granary*, also shown in fig. 996, have been described in § 779.

1016. *The Sheep-house* has been described in § 767.

1017. *General Estimate.* The actual cost of the house, barn, stable, cow-houses, &c., and of the cart-shed and granary, in the neighbourhood of Paris, amounted to £1427, and the average for the provinces would be about £855. The expense of the rick-stands and of the drying-shed is not taken into this account.

1018. *Remarks on the Farmery as a whole.* To the eye accustomed to admire only the extensive quadrangles of stone covered with slate, common in the best agricultural districts of Britain, neither beauty nor convenience will be seen in the scattered disposition of the objects in fig. 996; but let such consider the very different circumstances which exist between a country where timber is the sole or principal building material, and another where easily worked stone is abundant. The great object, in all agricultural constructions, is, to attain the end in view in the most effectual manner, by the simplest and most economical means; and this result will be found to be as completely attained in the French farmery as in the British one. With respect to the scattered appearance of the building, that is fully justified by the security which it affords from the spread of fire; and if we imagine the whole surrounded by fruit trees, as Morel Vindé proposes, and as is generally the case in France, we shall find as much or more beauty, though of a different kind, as in any of the farmeries of Britain. We have already observed, that we have introduced this Design and others by Morel-Vindé, chiefly with a view to new countries, for which they form admirable models.

Design XXV. — *For a Court of Feeding-houses, built for the late Thomas Hibbert, Esq., at Chalfont Lodge, Buckinghamshire.*

1019. *The object* of these feeding-houses was, to fatten cattle and swine at the least possible expense; and with the greatest product of manure, consistent with a due economy of straw for litter. For this purpose, arrangements were made by open gutters in the feeding-houses and pigsties, and by underground drains communicating with them, to convey all the urine to one tank or pit. In furtherance of the same object, the dung, consisting of the litter and droppings of the animals, was conveyed from the feeding-houses, and sties directly to a dunghill under a roof, and there it was watered, by means of a pump and spouts, with the liquid from the manure tank. Fig. 1018 will give a general idea of the whole.

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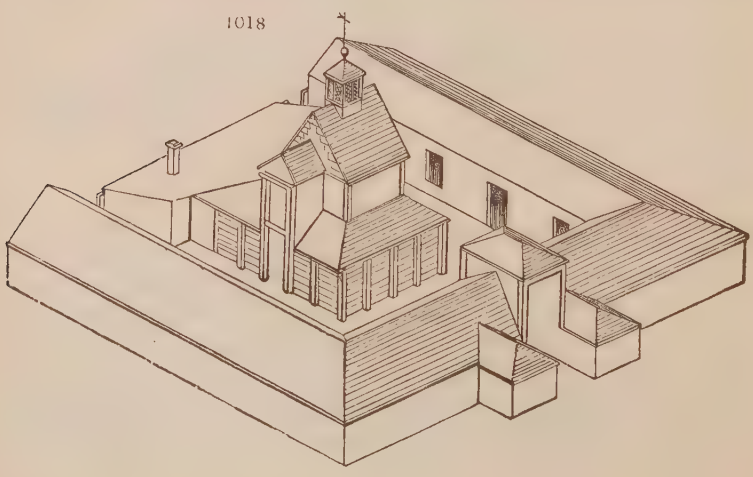
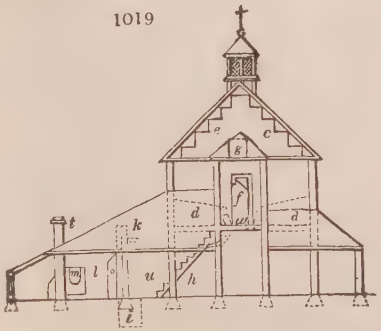


1020. *Details.* Fig. 1020 is a ground plan, in which *a a a a* form the area of the dunghill, which is covered with a lean-to roof on all sides as far as *b b b b*, which letters mark the situation of oak posts, 16 feet apart, and 8 feet high above the surface, supporting a granary floor, over which there is a pigeon-house, with the boxes for the pigeons fixed to the rafters of the roofs, as indicated in the section fig. 1019, at *c c*. The floor of this granary is divided into 7 bins, indicated by the dotted lines forming the squares marked *d*, and by the same letter in the section. There is a porch, *e*, for receiving and delivering corn by means of a crane and pulley, as indicated at *f* in the section. In the upper part of this porch there is a small door to the pigeon-house, *g*, and the ascent is by an outside step-ladder, *h*. Under the porch carts or waggons may enter, and pass completely round or through the area roofed in, so as to take up dung

1019



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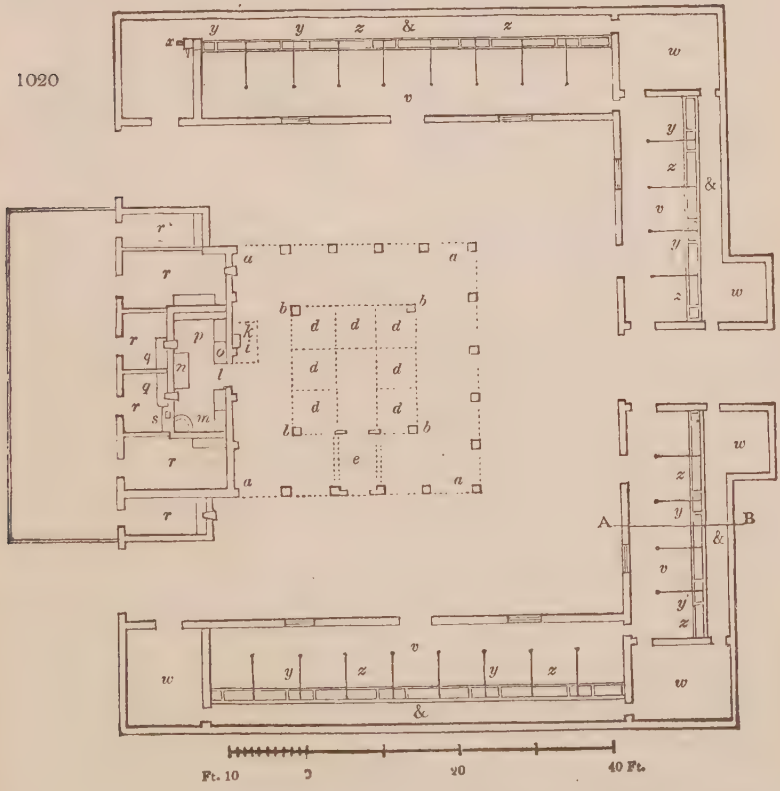
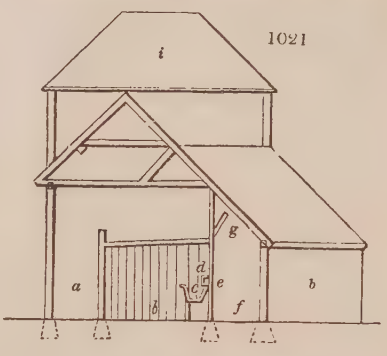


at any point. There is a cesspool, *i*, with a pump to it, rising 8 feet above the surface at *k*; and there are a number of spouts, which can be joined one to another, from the pump all over the dunghill, so as to convey the liquid of the tank to all or any part of the latter. This operation was performed at Chalfont Lodge every morning. There is a pigs' kitchen, *l*, which has a copper, *m*; hog-tank, *n*; bins, *o*, feeding hoppers, *p*; hog-troughs, *q*; and sties, *r*. The flue and chimney of the hog's copper are seen at *s* in the plan and at *t* in the section. From two of the bins in the granary there

are spouts, indicated in the section at *u u*, for shooting down corn from the granary to the bins, *o*, there to be mixed up, or used, as required. The cattle-feeding houses, *v v*, are fitted up with stalls, racks, and mangers, like stables, and there are foddering-bays, at each end, and at the angle, *w w w*, for hay, oil-cake, turnips, &c. In one of these there is a pump, *x*, which supplies water to the divisions, *y*, in all the mangers, by means of a spout, *z*, at the back of the mangers, and between them and the partition which separates the stalls from the feeding-passage, &c. Fig. 1021 is a cross section of the feeding-houses, in the line A B, in which are seen the passage behind the stalls, *a*; the partition between the cattle, *b*; manger, *c*; water gutter, *d*: partition separating the foddering-passage from the stalls, *e*; foddering-passage, *f*; hay-rack, *g*; fodder-bay, *h*; and roof over the gateway, *i*. Fig. 1022 is a section, taken across two stalls in the feeding-house, in which are shown, *a a*, oak posts, 5 inches square, let into the ground; *b*, a cistern for water, 3 feet in length, 12 inches wide, and 15 inches deep, placed between two stalls so as to supply water to each, and being raised 3 inches above the manger; *c c*, mangers for dry meat, 3 feet long, 12 inches wide, and 12 inches deep; and *d*, the situation of the spout or trunk of wood, 2 inches square, which runs along the back of the manger, for supplying water to the cisterns. This line of spouts is on a perfect level; so that, when water is pumped into it at one end, it runs along it to the other, supplying all the cisterns in its course. Where the spout crosses the foddering-bays and the gateway, it passes under ground, rising up again to the same level on the opposite side. These cisterns are intended to be pumped full every day, and the person pumping is rendered aware of the cisterns being full, by the water first becoming stagnant in the trunk, and afterwards running over the end immediately under the spout of the pump, which is purposely made one inch lower than the top of the cisterns. The hay-racks are shown at *e e*; *f f* are the doors through which the cattle are fed; *g g*, the boards of the partition between the stalls and the foddering-passage; and *h h*, the brick-work on which the mangers and cisterns are placed. In the construction of these feeding-houses, granary, and pigsties, all the posts which are fixed in the ground, and all the sills into which the uprights are framed, are of oak; and all the other scantling and boards are of Scotch pine, grown on the premises. The granary and piggeries have tiled roofs; but the feeding-houses are thatched with straw.

1021



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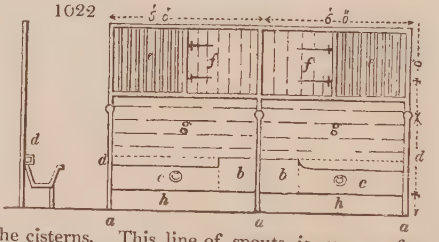


1021. *Remarks.* We received this Design from Mr. Main, who informs us that it was built in 1796, by the late Mr. Howes, land steward at Chalfont Lodge, and who was succeeded in that capacity by Mr. Main, a few years afterwards. We have made some trifling alterations and additions, for the purpose of completing the square, and giving the whole a more symmetrical form; but we have in no respect altered the dimensions of the stalls, or the different details. The arrangement and contrivance of the whole we think most excellent in theory, and Mr. Main informs us that it was found to be not less so in practice. The mode of conveying water to the different stalls may seem too expensive for common commercial farms; but it is not unfrequent on feeding farms in Lincolnshire, where oil-cake is much in use for feeding cattle. Instead of a wooden gutter, we have observed in the neighbourhood of Gainsborough, gutters, and also mangers, and stall partitions, of freestone. In most other situations, lead or iron piping would be found cheaper than wood. An immense quantity of dung, we are informed, was produced by means of the tank, from which the dunghill was kept constantly moist, and the roof over it, which prevented evaporation. We should have thought that the exhalations from the dung would have affected the air, and consequently the corn in the granary; but we are assured that this was by no means the case; because the latter was double-floored and thickly covered, on the outer side, with several coatings of boiling pitch.

Design XXVI. — *A Farmery for extensive Iron-Works, erected at ————, in South Wales.*

1022. *The object* in view, in this establishment, is, to prepare food and supply lodging for fifty working horses, and the men who manage them. It was sent us by our esteemed friend, Mr. Samuel Taylor, at once a practical and scientific farmer, and a literary man.

1023. *Accommodation.* Fig. 1023 shows the general appearance of the quadrangle;

1023

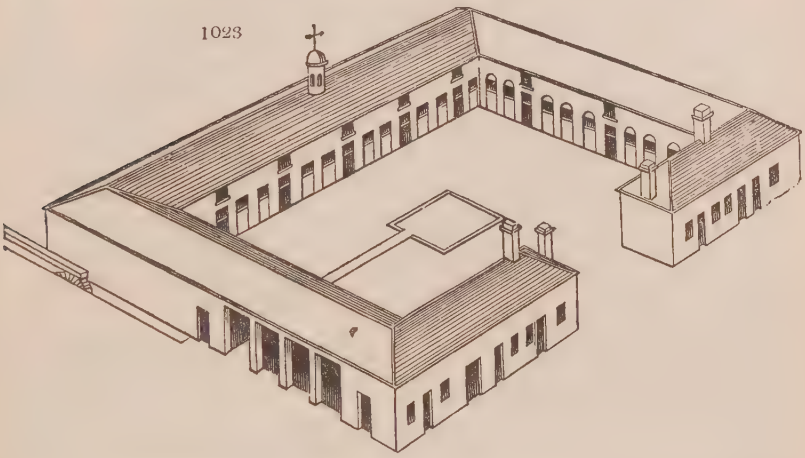
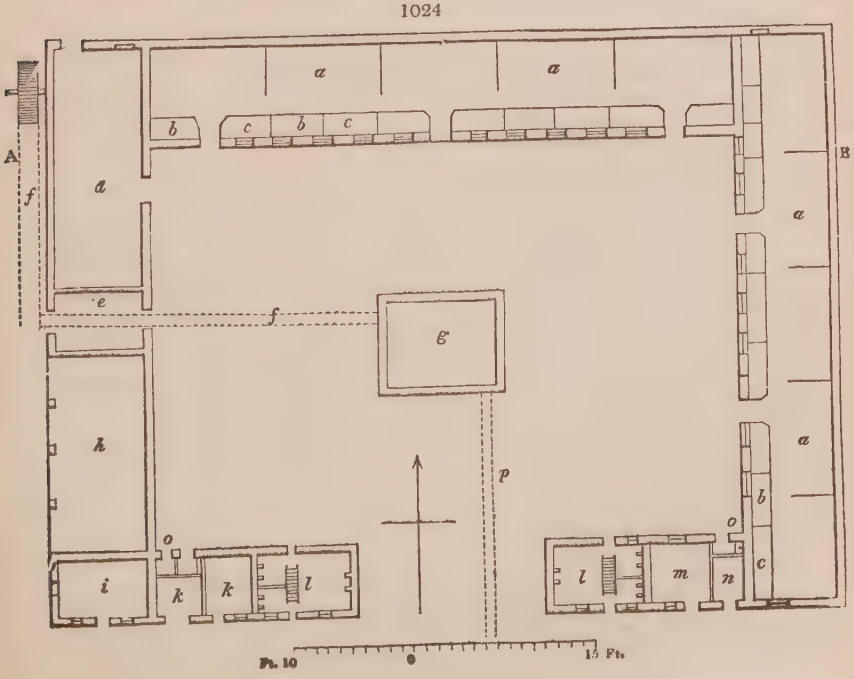


fig. 1025 is the elevation of the north side, and the section of the east and west sides, as taken on the line A B; and fig. 1024 the ground plan. The stabling for fifty horses is

1024



in ten divisions, marked *a*, containing five horses in each. In every division there is one chaff-bin, marked *b*, and one harness cupboard, marked *c*. These bins and cupboards are formed of boards in the manner of lean-tos, as shown in fig. 1025, at *c*. They are lighted

1025

by the lower panes of the windows, their roofs being carried high enough for that purpose. The upper panes light the stable over the lean-to slope. There is a barn, *d*, in which is a threshing-machine driven by a water wheel; which wheel also drives a straw-cutter, a machine consisting of a pair of rollers for bruising oats, and one for washing turnips or potatoes. There is a turnip-house, *e*, in which turnips are washed by the tail dam, or water from the overshot wheel, which is led through the house, in the underground drain marked *f*, to the washing-pond in the centre of the yard, marked *g*. This pond is about two feet and a half deep, and is paved at bottom, for the purpose of washing the horses' legs. There is a cart and waggon shed, with a granary over, *h*; a sick-horse stable, *i*; implement-houses, *k*; two comfortable cottages, *l*, with six rooms each, three having fireplaces, and three being without; a workshop, *m*; a tool-house, *n*; and three privies, *o*. The water from the overshot wheel, after passing through the horse-pond, *g*, runs off by the underground drain marked *p*.

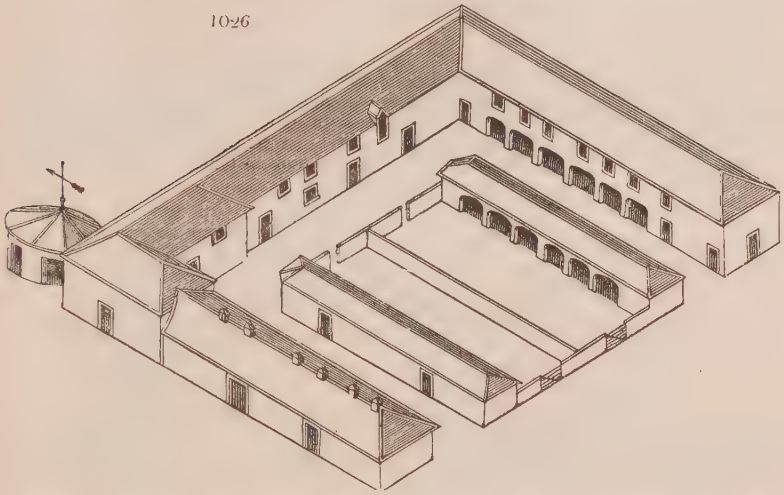
1024. *Construction.* The walls are of the slate stone quarried on the spot, the mortar used being made from the limestone of Aberthaw, which was considered by the late celebrated engineer Smeaton as the best in Britain; and, when mixed with clean sharp sand, as equal to any cement known in his time. The roofs are of fir covered with slate. The floors of the stables are perfectly level, with underground gutters, and gratings over them under each horse. There are no partitions between the horses, except those between every five; but the space allowed for each horse is six feet, which is more than is found in most farmeries. There are mangers of double the usual size, but no racks; the horses being fed with straw and hay cut into chaff, and mixed with corn, roots, salt, and water, and given in a semifluid state. No horses ever thrive better than those so treated; and the expense was found to be less than that of the common mode of feeding in use among farmers.

1025. *Remarks.* Little care seems to be taken, in this farmery, of the dung or liquid manure; but it is most gratifying to observe the striking difference between the labourers' cottages shown in this Design, and those on the Scotch and Northumbrian farms. The truth is, that the Scotch and Northumbrian farmers have the fear of their landlords continually before their eyes, and dare not venture to increase the comforts of their labourers, lest they should be thought too comfortable themselves. In every country, all the comforts which the labouring classes without fixed property enjoy above the starvation point, they owe to the commercial classes. Where landed property is in immense masses, farms are necessarily large, small properties few, and manufactures or commerce scarcely known. Under such circumstances, there being only a demand for one description of labour, and that of the rudest kind, the mass of the population are easily kept in a condition little better than if they were the slaves of their employers. Hence the low state of the agricultural labourers in the farm districts of Scotland and the north of England, and, indeed, of all the purely agricultural districts of Britain, compared with their state in the manufacturing, commercial, or mixed districts, where the different kinds of labour required necessarily produces different degrees of remuneration, and where the laborious classes of every description acquire higher tastes, and rise in the scale of comforts. All the comforts which the lowest class of society enjoy, they owe to the introduction of manufactures and commerce; and it gives us pleasure to pay a tribute of respect to this great Welsh Iron Company, for the comfortable cottages which they have built for their carters, as we did before (§ 481) to Messrs. Jones and Wilcox, the eminent builders, for the dwellings they provided for their workmen.

Design XXVII. — *A Farmery for a Farm of 250 Acres in the Valley of Strathmore, where a Rotation of Seven Crops is followed, the Grass Division being pastured the Second Year.*

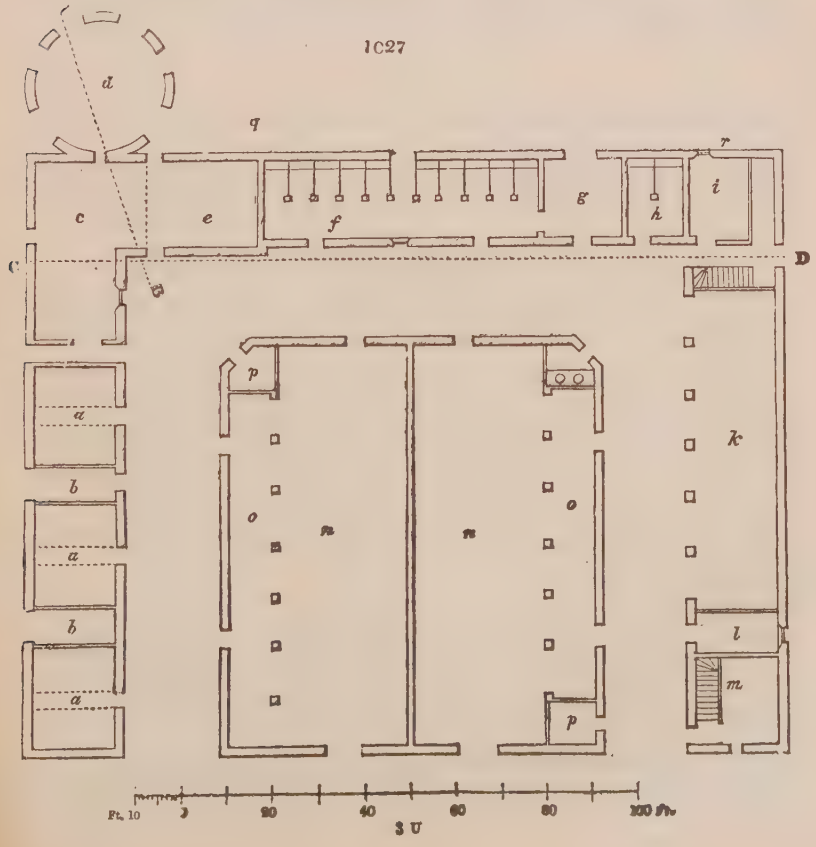
1026. *Accommodation.* Fig. 1026 shows the general appearance, and fig. 1027 is the ground plan. In the latter are seen three cow-houses, *a*; with foddering-bays, *b*; barn, *c*; horse-course for threshing-machine, *d*; straw-barn, *e*; stable for ten horses with a foddering-bay in the centre, *f*; house for potatoes or grass, *g*; two-stall stable, *h*; cow-

1026



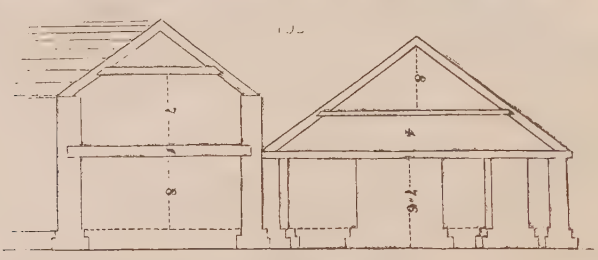
house, *i*; cart-shed, with granary over, *k*; carpenter's shop, *l*; tool-house, with spare room over, *m*; cattle-yards, *n*; open sheds for cattle, *o*; pigsties, *p*; and rick-yard, *q*.

1027



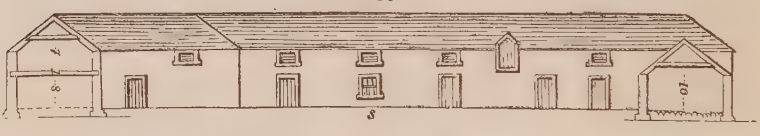
A place for poultry is supposed to be formed over the cow-house, *i*; and entered by an outside stair at *r*.

1027 *Construction.* The walls are of stone, and the roof slated. All the doorways and window-openings have facings, sills, and lintels of dressed stone, and all the doors are hung by strap hinges on hooks leaded into the stone; and they shut into rebates in the jambs. The feeding-houses have ventilators in the roof; one upright tube, about a foot square, with a cover to protect it from the rain, being placed in the ridge over each stand of four cattle. *Fig.* 1028 is a section across the mill-shed and barn, on the line



A B; and fig. 1029 is an elevation and two sections on the line C D. In the latter, the stable window, *s*, is shown with the upper part of glass and the lower part of spars for

1029



the admission of air, with an inside shutter for occasional use. The stable-loft windows over are shown luffer-boarded.

1028. *Remarks.* This Design has been sent us through our esteemed friend and valuable correspondent Mr. Gorrie, by Mr. James Chalmers, land surveyor, and land steward at Muithly, in Perthshire. Mr. Chalmers is evidently a good Architect as well as land-surveyor, the Design being well arranged, and the elevation architectural.

Design XXVIII. — *A Farmery for a particular Situation, suitable for Eighty Acres of arable Land, and Three Hundred Acres of Pasture, in the Carse of Gowrie.*

1029. *This Design* is calculated for a steep declivity; so much so, that the floor of the granary and straw-loft, which is on a level with the ground on one side of the range, is ten feet above it on the other. The general appearance is shown in the isometrical view, fig. 1031.

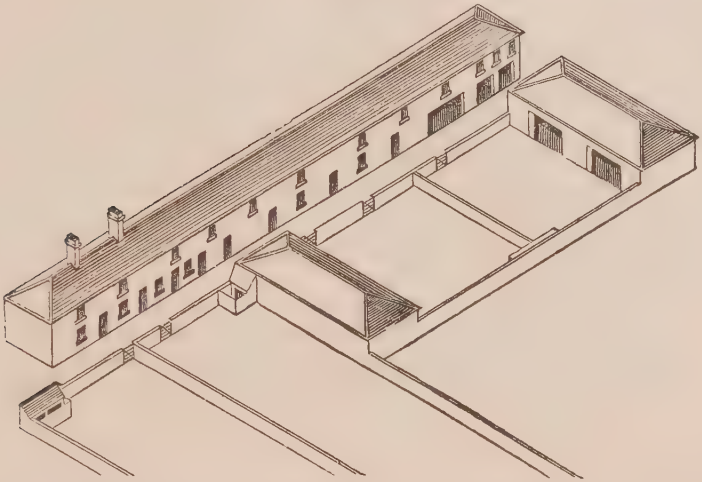
1030. *The Accommodations* are seen in the plan, fig. 1032, in which *a* is a cart-shed with a granary over; *b*, the threshing-mill course; *c*, the dressing-barn; *d*, a stable; *e*, a feeding-house for cattle; *f*, a cow-house; *g*, a poultry-house; *h*, a boiling-house; *i i*, ploughmen's cottages, each sixteen feet by seventeen feet, and two stories high; *k*, a privy; *l l*, cattle-sheds; *m m*, open yards for cattle; *n*, pigsty of the farmer; *o o*, pigsties of the two cottagers; and *p p*, the gardens of the cottagers; each containing twelve falls, or about one thirteenth of an acre.

1031. *Construction.* The walls are of the common stone of the country, and the roofs slated. Fig. 1030 is a section taken on the line A B, which shows the steepness of the situation.

1030

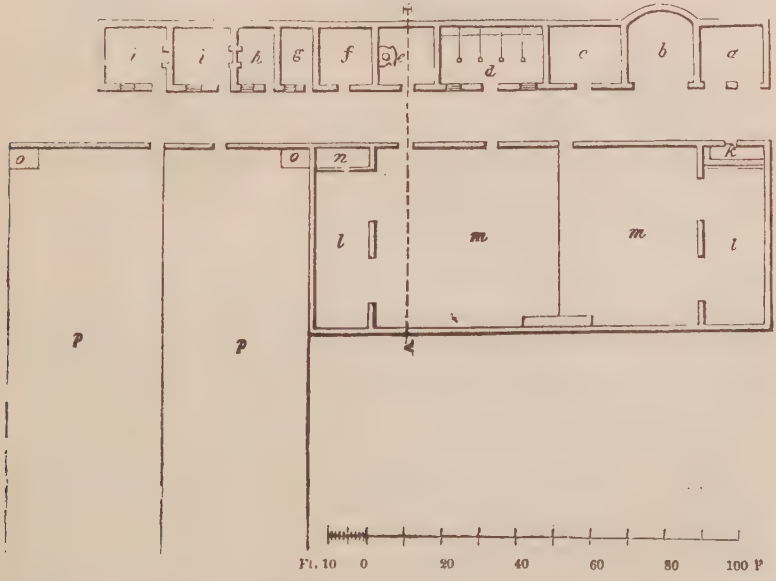
1032. *Remarks.* This Design has been sent us by Mr. Gorrie, accompanied by the following remarks: — "The dung from the stables, and cow and cattle houses, is thrown into the cattle-yard across the road, by which means it becomes mixed with the litter of the yards in which young cattle are kept during winter and spring, and enclosed in summer and autumn. The advantage offered by this form of farmery, when the

1031



buildings are not of sufficient extent to enclose three sides of the straw or cattle yard, and where the surface of the ground is a declivity, is, the facility of carting in corn to the threshing-mill loft in winter, and turnips for the byres in sharp seasons; and clover for the stable and byres in summer. The disadvantages of adhering strictly to this plan, which is taken from an old steading, are the narrowness of the threshing-mill course for a

1032



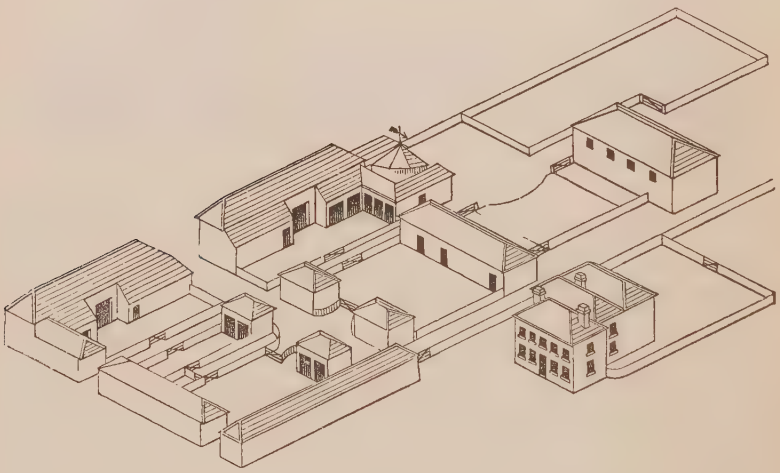
mill of four-horse power. The machinery, too, being across the house, is too much confined, admitting of only one shaker (a part of the machine), which throws the straw on the loft, imperfectly freed from the grain. In the present instance the ground occupied by the steading is on a dry freestone rock, and the lower part of the range does not suffer from damp, to prevent which expensive draining would be necessary for a similar range on humid soils. A turnip-house placed at the back of the feeding-byre is a desideratum

in this Design, but was not thought of in laying it out; the culture of turnips not being extensive when it was built. Potatoes are for the most part kept in pits, and a house for that article is often dispensed with in this district." We consider this Design of considerable value, as indicating how to manage farm buildings on declivities. In such situations, where there is a stream, very favourable opportunities frequently occur of driving the threshing-machine by water, with very little expense in forming the head-dam or tail-dam. At Underley Park, in Westmoreland, there is a very complete farmery, built on the margin of a stream, the barn stretching across it, and the wheel of the threshing-mill so contrived as to meet the whole of the water of the stream. The banks being thirty or forty feet high on one side, and not much above the level of the water on the other, the corn is carted from the ricks into the barn, and shot down at the feeding-board of the machine; it is cleaned in the floor below, from which, through a trap-door, it is dropped into the ground floor, or into carts to be taken to market. We saw this farmery in 1811, and then considered it, in this and in various other respects, as remarkably complete.

Design XXIX. — *The Farm House and Farmery of Starston Place, near Harleston, in Norfolk, suitable for a Farm of 350 Acres under the Norfolk System of Culture.*

1033. *Accommodation.* The general appearance is shown in fig. 1033, and the ground plan in fig. 1034. The house contains a vestibule, *a*; two parlours, *b*, *c*; an office, *d*;

1033



a lobby, *e*; store-room, *f*; pantry, *g*; kitchen, *h*; back-kitchen and bakehouse, *i*; back entrance, *k*; a dairy, *l*; and larder, *m*. In the farmery there are: — 1 1, barns; 2 2, porches to ditto; 3 3, cattle-sheds; 4 4, cattle-yards; 5 5, turnip-houses; 6, cart-horse yard; 7 7 7, cart-horse stables; 8 8, hay-houses; 9 9 9, chaff-houses; 10 10, horse-sheds (open to yard); 11, yard for colts; 12, shed to ditto; 13, stable to ditto; 14 14 14, pens for sheep or pigs; 15 15, pigsties; 16 16, swill-house and cistern; 17, cow and sheep yard; 18, cow-shed (open); 19, cow-house; 20 20, calf-cribs; 21 21, hay and turnip-houses; 22, horse-pond; 23, sheds for waggons, carts, and implements, with granary over; 24, stack-yard; 25, house for horse-wheel; 26, chaff engine-house; 27, shed for implements; 28 28, &c., passages; 29 29, &c., lock-up gates; 30, riding-horse stable, chaise-horse, carpenter's shop, tool-house, &c.; 31, garden and orchard; and 32, kitchen-garden.

1034. *Construction.* All the walls of the buildings and yards are of flintstone, as are those of the barns, to the height of 6 feet, above which they are of studwork, boarded, 14 feet higher. The house and all the farm buildings are covered with slates.

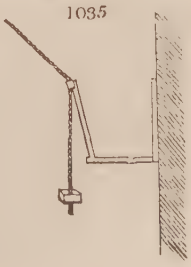
1035. *Remarks.* This Design was contributed by Mr. Samuel Taylor, the nephew of the proprietor of Starston, Meadows Taylor, Esq., of Diss. The general arrangement seems good; all the cattle-houses and cattle-yards being conveniently situated with regard to the two barns; and the cart-shed, 23, and carpenter's shop, tool-house, chaise-

1034

house, &c., 30, being detached from the buildings and yards for animals; and, consequently, being free from straw, the obligation of opening and shutting gates, and the risk of letting out cattle, &c. The farm house has the most ample accommodations. Mr. Taylor has sent us a plan of Starston farmery, as it appeared some years ago, when the same accommodation was scattered about in all directions, to the great inconvenience of the occupant. In reply to some questions respecting the construction of the racks and mangers, and the farm-yard management of Norfolk, Mr. Taylor has sent us the following valuable information: —

1036. "*The Norfolk System of Farming Management* differs materially from that pursued in most other counties of England, in not having any stalls or divisions in the stables, save, perhaps, one for a vicious or troublesome horse; the rest stand close to each other, each tied to the manger by a halter, at the end of which is a log of wood, as in fig. 1035, sufficiently heavy to draw down the halter after its being raised by the horse, in lifting up his head; and thus, by keeping the line stretched, preventing the horse from getting his feet entangled therewith. The horses are not confined to the stable, except at feeding and cleaning times, when they are tied up; at other times they are turned into a dry well-littered straw-yard, between the stable and the horse-sheds, 10 10, which, being open to the yard, they can resort to for shelter. The door of the stable is left open every night. This is done in all seasons, and in all weathers; and it is a well-known fact, that, be the weather ever so rough, the horses generally prefer lying in the open air. Of course, in pursuing this yard system, it will be desirable to keep a good look-out, especially in the first instance, that no horse of a quarrelsome domineering temper be suffered to mix with the

1035

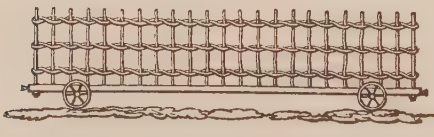


rest. Again, in some stables, there may be a horse of a particularly timid disposition, who seems a sort of butt of the whole stud; and who, if he could speak, would doubtless exclaim with Falstaff, 'Nags of all sorts take a pride to gird at me.' All such should be separated from their fellows, or accidents will very likely happen. It is not well to put too many horses together in one yard. In Lancashire and other parts of the north of England, the farm horses are clothed up in warm close stables; the consequence of which is, that if a horse stand any little time in a cold wind, even though his cloth be on, he is almost sure to catch cold, and be laid up. Now, a Norfolk man never clothes his horses; unless, perhaps, in very severe weather, when a carter throws a sack, or some such covering, over the horse's loins, while corn or other articles are loading or unloading. This is proper enough, but anything beyond it tends to make the animal tender, and susceptible of cold." With respect to the keep of farm horses, Mr. Taylor is decidedly in favour of cutting their fodder, whether it be hay, straw, or a mixture of both. The best criterion of the excellence of this plan is the fact, that, in seasons when the hay crop is unusually short, farmers invariably resort to it as a measure of economy, in order to make their stock of fodder hold out.

1037. *The Norfolk System of managing Cows and Cattle* is the same as that for horses; except that in the cow-houses and cattle-sheds there are no racks, but only troughs or mangers from which they eat their food.

1038. *The Sheep System of Norfolk* is very simple; though some persons go to a great expense for movable racks and feeding-troughs. Mr. Taylor thus describes, in the *Country Times*, a movable fold, with a sheep-rack attached, which he used for a number of years:—"It is well known that, in setting and striking a fold in frosty weather, there is not only great difficulty, but that the wear and tear of the hurdles is considerable; to say nothing of the loss of time incurred by the frequent repetition of this operation. Wicker hurdles are made on a frame, with holes bored for the upright stakes; around and between which, the smaller wood is woven or wattled. The frame is usually six feet long, and of course this is the length of each hurdle. Instead of a six-feet frame, get a larch pole, or oak stand that will square about five or six inches, and is about eighteen or twenty feet long. Bore holes in this similar to, and at the same intervals as, those of a hurdle frame; then fix it on a pair of axletrees about four feet long; each axle-tree having attached to it a pair of cast-iron wheels, just high enough to carry the hurdle when finished; the whole presenting an appearance like that of fig. 1036. For greater strength, the end uprights may be of iron, fastened to the bottom with nuts and screws. Fig. 1037 is an end view of the hurdle on its axle, with the addition of a small, or back,

1036



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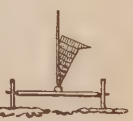
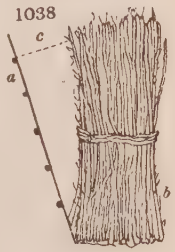


hurdle, as it is sometimes called, sloping outwards, and forming the economical hay-rack of which we have been speaking. Being low, the strain on the main hurdle is but trifling, and it is easily kept in its place by tar line. The hay forms not only food but shelter for the sheep. About a fourth of the total length of the movable fold may thus be made into hay or straw racks in a very few minutes; and the whole fold can be shifted by a man and a horse in the tenth of the time it would take to remove it if formed of common hurdles and stakes. Iron rings or staples are provided at the end of each division of the fold, to which the horse is fastened when it is wanted to be moved. There being but little wear on the hurdles, they will last treble the time of those in general use, and, even when the wickerwork decays, it may be replaced at the cost of a few shillings. A fold on the same principle was invented by the late Mr. T. Plowman of Broome, near Bungay, but it was made of sawn stuff, painted, and of course vastly more expensive in its construction." (*Country Times*, vol. i. p. 27.) Mr. Taylor has suggested a still cheaper sheep-rack and fold, which may be formed in a few minutes, of wicker hurdles (which cost about 10*s.* or 11*s.* per dozen), set sloping round a yard, as represented in the section fig. 1038; the yard itself being supposed to be fenced in with bush faggots (faggots composed of thorns from the hedges, which, when wanted for yard fencing, ought to be cut with the leaves on, and stacked flatwise previously to using, in order to render them close and compact; thus treated, they will also go further, and make a better fence); *a* represents the line of hurdles, and *b* the faggot fence. The hurdles may be secured at top to the stakes of the faggot fence with a piece of tar-

line, *c*. Between the hurdle and the faggots is placed the fodder, which serves the triple purpose of food, shelter, and protection to the sheep from the thorns of the faggots.

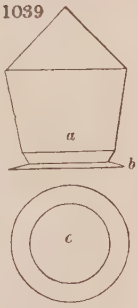
1039. *The Norfolk System of managing Swine* has nothing in it which requires any variation of construction from the form of pigsties in use in other districts.

1038



1040. *A Substitute for Rickstands*, the invention of the late ingenious and excellent Robert Paul (see his humane rat trap, *Gard. Mag.* vol. vi. p. 584.), Mr. Taylor recommends as being equal for ingenuity and utility to any of the more costly inventions that have been published, having practised it himself for several years. "At harvest time the stack, as soon as up (every thing depends on this), is cut under a little at bottom; and immediately a coat of mortar, or clay and horse-dung mixed, is applied round the bottom to the height of about two feet and a half; the stack, when finished, presenting the appearance of fig. 1039; in which *a* is the upper line of the composition spread round the foot of the stack. If the soil on which the stack is placed be soft and sandy, it may perhaps be advisable to form a bottom projecting from the stack, as shown at *b*, covered with the same composition as the space between *a* and the ground; but this need not occupy the whole area of the stack bottom, but only a circle round its edges, formed somewhat like a quoit, as at *c*. It must not be forgotten that the complete success of this plan depends on its being executed as soon as the stack is built; an hour must not be lost, otherwise vermin may get possession. Too much caution cannot be taken to suffer no straw, ladder, nor stays, to remain near the stack, and in contact with it; for by them mice may get in, and if once there, they are not to be got out; for they do not, like rats, leave the stack for drink, not requiring it: they breed fast, and do a vast deal more harm to wheat than rats. This plan of Mr. Paul's is adopted by Mr. Coke at Holkham. The expense is only a few shillings for even a large stack." Perhaps to some it may appear a deviation from Architecture to enter into the uses of structures to the extent which we have done here, and in other instances: but we are decidedly of a different opinion; feeling confident, from experience, that no real improvement will ever be made in any class of buildings, with the uses of which the Architect is not thoroughly acquainted.

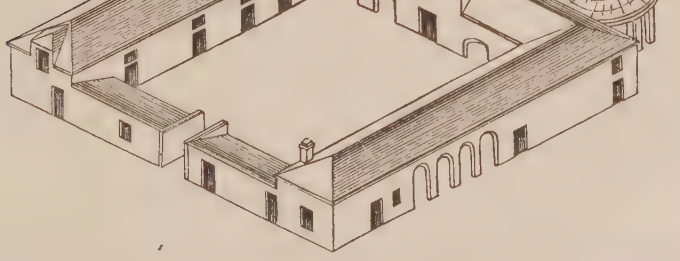
1039



Design XXX. — *A Farmery for a Farm of* 300 *Acres of arable Land, and* 500 *of Pasture, in the West Highlands.*

1041. *Accommodation.* The general appearance is shown in the isometrical view, fig. 1040, and the ground plan in fig. 1041. The latter shows a pigsty, 18 feet and a

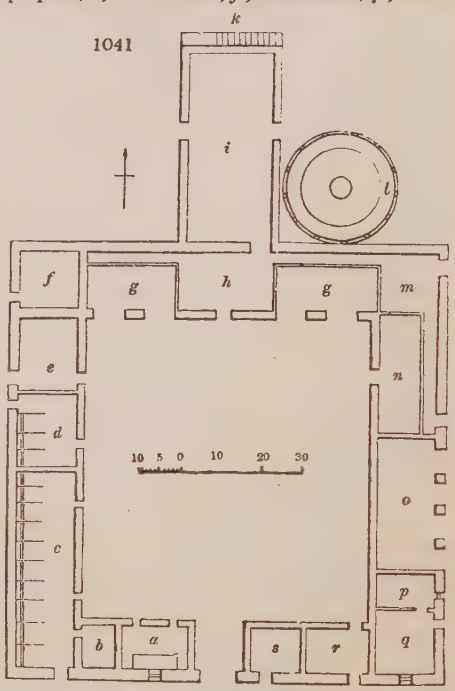
1040



half by 12 feet, *a*; a room for the corn-chest and horse-harness *b*; a working-horse stable, 16 feet wide, and 48 feet and a half long, for ten horses, *c*; a riding-horse stable, with two

spare stalls, *d*; a place for general purposes, *e*; a tool-house, *f*; cattle-sheds, *g*; straw-house, *h*; a barn with a granary over it, *i*; a stair to the granary, *k*; a horse-course under the mill-shed, *l*; the turnip-house, *m*; cow-house, *n*; cart-sheds, *o*; cheese-room, *p*; milk-house, *q*; calf-house, *r*; and poultry-house, *s*.

1041



1042. *Construction.* The walls are built of the local stone, 2 feet thick where the buildings are two stories high, and 18 inches thick where they are only one story in height. The stable and cow-house doors are 3 feet and a half wide, and the others 3 feet. The door in the end of the stable is 4 feet wide, and those of the pigsties, poultry-house, and calf-house are 2 feet and a half. The mill-shed is 30 feet in diameter, outside measure; and the horse-course is 4 feet wide. The timber of the roofs is Highland fir, and the slate is from Westmoreland. Other particulars of construction will be found in the specification of a succeeding Design.

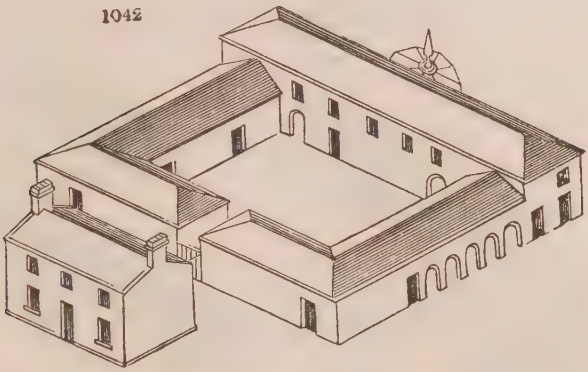
1043. *Estimate.* Cubic contents 114,912 feet; which, at $1\frac{3}{4}d.$ per foot, the price which it appears such buildings cost in the Highlands, is £837 : 18*s*.

1044. *Remarks.* This Design, and the three which follow, have been sent us by William Ross, Esq., Architect, Bristol; a native of that part of Scotland for which these farm buildings are intended, or in which they have been executed. The arrangement of the ground plans of the whole, and the details of the specification given with the fourth Design, show an intimate acquaintance, on the part of Mr. Ross, with the accommodations required; and we therefore consider them as well deserving a place in this collection. Mr. Ross observes that the prevailing winds in the neighbourhood of Tarbat, in Ross-shire, are from the N. W.; for which reason he has put the low side of the square, and the entrance gate, on the S. W.; and generally placed the buildings which require to be two stories high on the N. W. and N. E. sides. These are obviously judicious arrangements. — In the Design before us, the barn and straw-house are centrally placed; and the feeding-passages from the latter are convenient. We should have preferred reversing the position of the large stable, with those of the tool-house and turnip-house, for the sake of connecting it with the feeding-passage; but Mr. Ross informs us that it is placed in its present position, agreeably to Waistell's maxim, that the stables and cattle-houses should be near the dwelling-house, to hear when any thing is wrong among the cattle. In a cold country like Ross-shire, it is very desirable to have the pigsties entirely roofed in, as they are in this Design; and we think the poultry-house should always be placed adjoining the cow-house or stable, for the sake of heat. The corn-chest and harness-room, connected with the stable, is good and convenient; the horses are in separate stalls, which ought always to be the case where they are fed on corn, unmixed with cut straw or chaff; because, otherwise, a fast-eating horse, when near a slow-eating one, will take part of his share. Where horses are fed on oats, or succulent food, mixed with chaff or cut straw, they may stand without stalls, as in Norfolk.

Design XXXI. — *A Farmery for* 200 *Acres of arable Land, and* 300 *of Pasture, in the West of Scotland.*

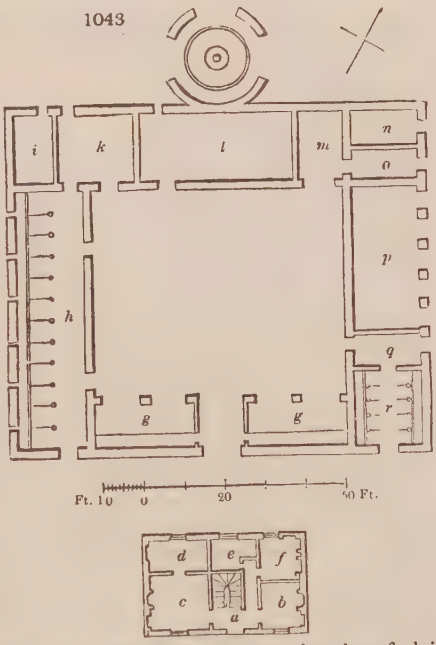
1045. *Accommodation.* The general appearance is exhibited in fig. 1042, and the ground plan in fig. 1043. In the latter are shown, in the house, a lobby, *a*, 10 feet 4 inches by 4 feet 6 inches, with a staircase and passage; a parlour, *b*, 11 feet and a half square; a dining-room, *c*, 13 feet and a half square; a bed-closet, *d*; a pantry, *e*; and a kitchen, *f*. On the floor above are four good bed-rooms and a bed-closet. In the

1042



farm-yard are two cattle-sheds, *g g*; a stable, *h*, with 12 stalls, 5 feet wide each; a tool-house, *i*; straw-house, *k*; barn, *l*; shed, *m*; hen-house, *n*; pigsty, *o*; cart-shed, *p*; calf-house, *q*; and cow-house, *r*, 20 feet by 18 feet, for ten cows. The construction is the same as in the preceding, and in the two following, Designs.

1043

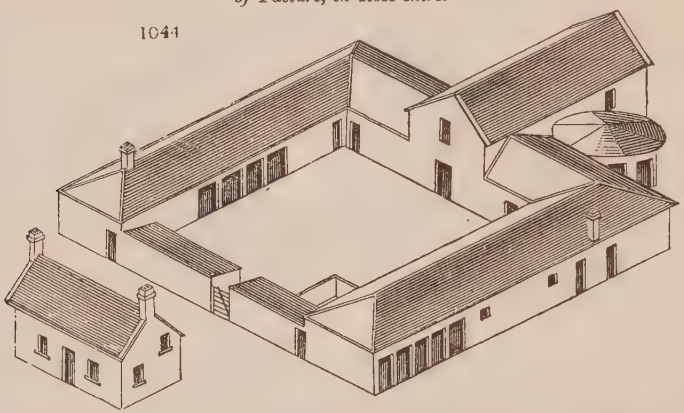


1046. *Estimate.* The cubic contents of the house are 19,200 feet; which, at 3*d.* per foot, is £240: those of the farmery are 97,370 feet; which, at 1½*d.*, is £608 : 11*s.* : 3*d.*

1047. *Remarks.* The arrangement of the farm buildings is compact, though we do not approve of the cattle-sheds fronting the N.E.; and as much is made of the house as could well be desired: the only circumstance in it that we regret is, the placing of the fire-places in the outside walls. But this plan of putting the fire-flues in the outside walls is not without some advantages: it renders thick walls wholly unnecessary in the interior of the building; in which case, as all the divisions between the rooms can be formed of quartering, lathed and plastered, such houses necessarily cost much less than those which, having thick outside walls at any rate, have also one or more thick walls inside, for the sake of the chimneys. It may also farther be observed, that, in countries where fuel is abundant, it is a matter of much less consequence whether the fireplaces are in the outside walls, or in the interior ones. In most parts of the Highlands of Scotland the fuel is peat, and hitherto it has been to be had in abundance. The idea of incurring any expense in construction therefore, with a view to saving fuel, is entirely out of the question. Equally so, we might add, is the idea of incurring expense to free the occupant from the risk of a smoky house; peat smoke being familiar to every inhabitant of the Highlands, more especially to the farmers and the working classes. In fact, houses regularly built of stone and lime mortar, are, comparatively speaking, luxurious in that part of the island. The reader who wishes full information on this subject, may consult *Loch's Account of the Improvements made on the Marquess of Stafford's Estates in Sutherland and Ross-shire.* In this work it is stated that numbers of the inhabitants refused to live in the new houses prepared for them, and others required some years to be reconciled to the clean and cold appearance which they alleged was produced by the want of smoke.

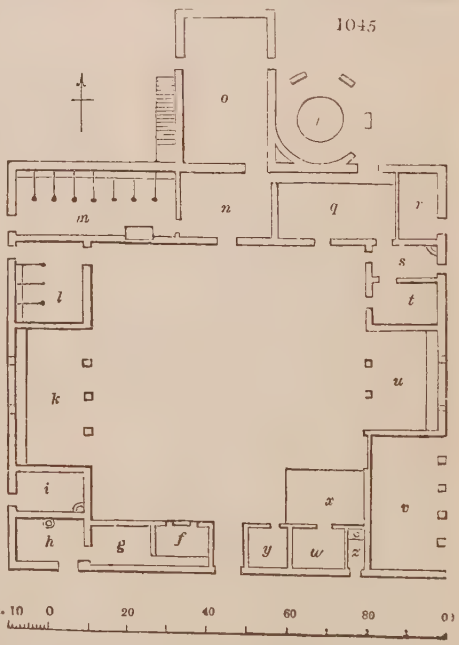
Design XXXII. — *A Farm House and Farmery for* 200 *Acres of arable Land, and* 300 *of Pasture, in Ross-shire.*

1044



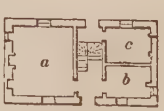
1043. *Accommodation.* The general appearance is shown in fig. 1044, and the ground plan in fig. 1045. In the latter, the house contains a living-room, *a*; small office or business-room, *b*; and kitchen, *c*. On the garret floor are two bed-rooms, *d*, *e*, lighted from windows in the gable ends, and with closets partitioned off under the roof. The farmery shows a place for hogs, *f*; potato-house, *g*; boiling-house, *h*; washing-house, *i*; cattle-shed, *k*; spare stable, *l*; work-horse stable, *m*; straw-house, *n*; barn, with granary over, *o*; mill-shed, *p*; cow-house, *q*; tool-house, *r*; dairy-scullery, *s*; dairy, *t*; cattle-shed, *u*; cart-shed, *v*; calf-house, *w*; temporary enclosure for calves, *x*; poultry-place, *y*; and privy, *z*. The construction is the same as that of the two preceding, and of the following Design.

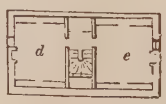
1045



1049. *General Estimate.* The cubic contents of the house are 13,376 feet; which, at 3*d.* per foot, is £167 : 4*s.* : those of the farmery are 112,708; which, at 1½*d.*, is £704 : 9*s.* : 4*d.*

1050. *Remarks.* This is a compact well arranged Design, as far as respects the farmery; and the washing-house appears to be a substitute for a back-kitchen to the dwelling-house; the latter being on a very confined scale, and, we suppose, intended for the residence of the grieve (bailiff). The cattle-sheds, *k* and *u*, are judiciously contrived so as to shelter the cattle both from the north-east and south-west winds, according to the prevalence of either; these winds being most severe.

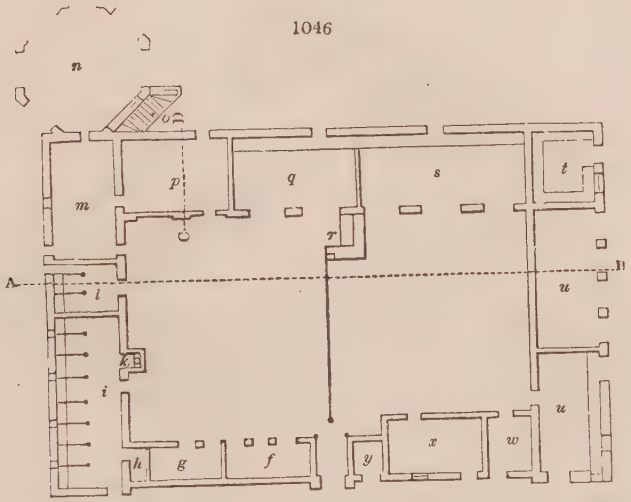


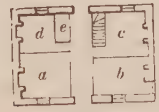


Design XXXIII. — *A Farm House and Farmery for 500 Acres, half Pasture and half arable, erected at ———, in the Parish of Tarbat, Ross-shire.*

1051. *Accommodation.* The general appearance is seen in fig. 1051, and the ground plan in fig. 1046. In the latter the house shows a dining-room, *a*; parlour, *b*; bed-

1046



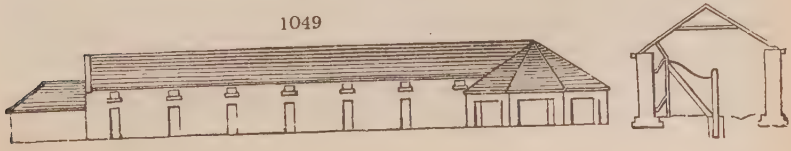


room, *c*; kitchen, *d*; and pantry, *e*; and on the floor above are four garret bed-rooms. The farmery shows a pigsty, *f*; place for calves, *g*; corn-chest, and harness-room, *h*; stable, *i*; privy in the same, *k*; spare stable, *l*; barn, *m*; covered horse-course, *n*; stair to granary over the straw-house and cattle-sheds, *o*; straw-house, *p*; cattle-shed, *q*; pump and water-trough, *r*; cattle-shed, *s*; poultry-house, *t*; cart-shed, *u*; cow-house with feeding-passage, *v*; boiling-house and dairy scullery, *w*; dairy, *x*; and coal-house, *y*.

1047

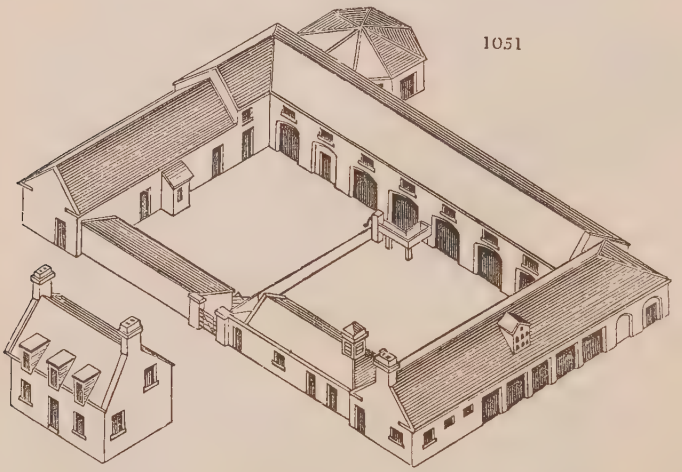
1050

1049



1052. *Construction.* The materials and kind of workmanship will be found detailed in the following specification, obligingly sent us by Mr. Ross; and which is intended to be elucidated by fig. 1047, a section and elevation on the line A B of fig. 1046; by fig. 1048, a section on the line C D; by fig. 1049, an elevation of the north side of the same figure; and by the section across the stables, fig. 1050.

1051



1053. *Specification of the Carpenter's, Mason's, Plasterer's, and Painter's Works, intended to be done in building and finishing a Farm Steading* for , tacksman (tenant on lease, a lease in the north of Scotland being called a tack) of ———, Parish of ——, Ross-shire, under the direction and to the entire satisfaction of William Ross, Architect, of No. 11. Pritchard Street, Bristol; and which is further explained by drawings made for that purpose.

1054. *It is to be understood that the following conditions apply to each trade respectively.*

1055. *The Contractor* is to find and provide every kind of materials, labour, hoisting, carriage, scaffolding, rules, moulds, tools, and tackle necessary for the due execution of the works, correspondent with this specification and drawings, to the full intent and meaning of both, as no extra-charge or day-bill will be allowed for any thing implied, expressed, or set forth, in *either* of them.

1056. *The Materials* are to be the best of their respective kinds, and the Architect, or his agent, shall have full power to reject any materials that may be brought on the premises which he may consider unfit for the purpose, or different from those described to be used in the works; and likewise the power to cause any unsound work to be altered, at the contractor's expense, or any works that are not executed according to the true intent and meaning of this specification and drawings, and to the directions which may be given from time to time by the Architect or his agent.

1057. *The Care of the Building* is to be with the contractor, as (the proprietor) will not be accountable for any thing that may be damaged, destroyed, or removed; but the whole must be left clean, perfect, and complete, in every respect, at the conclusion of the works. will not be bound to accept even the lowest tender, nor to proceed with the works, unless the amounts of the estimates are satisfactory.

1058. *The Contractor* must not allow any alteration to take place from this specification or drawings, without first obtaining a written order for the same from the Architect, or the proprietor, particularly describing such alteration; but if (the proprietor) or his Architect think proper to make any addition or omission, or to deviate in any manner from the drawings and this specification, such alteration, whether an addition or omission, shall not invalidate or make void this agreement, but the same shall be ascertained in the usual and customary way by admeasurement, and either added to or deducted from the amount of the contract (as the case may be), according to the list of prices herein after mentioned; and all extras or omissions not included in such list will be monied out (calculated) in proportion to such list.

1059. *Tenders* must be delivered in separate amounts for each trade; and it must be distinctly understood, that in each case a detailed bill of every article contained in the

estimate, together with the price at which each article was monied out, must accompany such tender sealed up, or it will not be accepted; and all variations from this specification and drawings, which may be ordered, shall be monied out from such list, and which is to remain in the hands of the Architect for that purpose.

1060. *The Works to be executed* in the most sound, substantial, and workmanlike manner; and, that the contractor may not consider himself in any way aggrieved, he must take special notice that *every circumstance* appertaining to the well-doing of the works will be *most strictly* insisted on, to the full intent and spirit of this specification and drawings; and that no indulgence will be allowed for any breach of covenants; and if any difference of opinion shall arise as to the quantity or quality of the workmanship or materials, or upon any other matter connected with the works, the contractor must in all cases be bound by the decision of the Architect.

1061. *The Works to be immediately begun* by taking down those parts of the present buildings that are intended to be removed, in the most careful manner; shoring up as will be necessary the adjoining walls, &c., which will be at the contractor's risk, until they are fully secured; repairing and making good all the walls, &c., that may be disturbed in consequence of this contract.

1062. *The Contractor may see the Site,* and he is expected to provide for every thing required to execute the works, without any extra-charge whatever, for any thing omitted in this specification or drawings.

1063. *The Money* is to be paid at the rate of £75 per cent on the amount of work done, by certificates to be signed by the Architect, and payable at fourteen days' sight; but the Architect will not certify for any sum less than £60, and the balance will be paid upon the certificate of the Architect, that the works are completed to his satisfaction, by bill at four months.

1064. *Carpenter.* The timber (unless where otherwise particularly described) is to be the best natural-grown Spey timber (Scotch pine, grown in a native forest on the banks of the Spey, and generally considered of superior quality); and, together with every other species of timber which may be hereafter described, for carpenter's and joiner's work, is to be well seasoned, for which affidavits must be given, if required by the Architect. The whole to be perfectly sound, free from sap, shakes, dead parts, and large knots.

1065. *All the Materials will be carted* from Portmahomack by the proprietor; but the contractor must not delay the carts unnecessarily, otherwise the proprietor will charge for such detention, and will deduct the amount from the balance in his hands.

1066. *All Timbers* to be cogged (notched) down, so as to have a solid bearing on the walls and plates; no joist, standard (quarter), or rafter, &c., to be more than 18 inches apart in the clear. All lintels, and filling in lintels (lintels behind the front lintels), to be not less than 2 feet longer than their respective openings, and 1 inch thick for every foot the opening is wide, and shored up where requisite. All bridlings (trimmings) and bridling joists to be one eighth of an inch thicker than the other joists, for every joist they support. The joists to be bridled (trimmed) for wells of stairs, for fireplaces and vents, and stiffened with herring-bone strutting, at distances not exceeding 4 feet apart. All scantlings and other dimensions given, must hold good, when the works are completed, cleaned off, and finished. No panels to be, when cleaned off, less than five eighths of an inch thick. To provide for all centring for arches, &c.; also, all blocks, studs, beads, stops, fillets, bilgets (wooden bricks). None of the flooring-boards to be more than 6 inches wide, and they must be prepared, and brought on the premises five weeks before they are laid. All the framing, such as doors, sashes, &c., must be got out in six weeks from the date of the contract; but not to be wedged up until the Architect or his agent directs. The door-frames are to be built in the walls, with horns (the lintels with projections beyond the styles) and side arms (side pieces to bond in), and tenoned into stone sills. The roof is to be formed as shown in the drawings, and of the several scantlings thereon figured, and well nailed with double garron (6-inch spikes) nails. All plates to be in long lengths, and chacked (notched or halved); or dovetailed together, and well spiked. To lay the floors throughout (unless where otherwise directed) of $1\frac{1}{8}$-inch Tarlogie (a native forest) deals, straight-jointed, ploughed, and feathered. The stairs to be formed as shown in the plan, of $1\frac{1}{8}$-inch Tarlogie deals, glued and blocked, complete, with $1\frac{1}{4}$-inch wall string and torus on upper edge; and where an open well is shown, to have $1\frac{1}{2}$-inch front strings. All the treads and risers to be raggled (housed) into strings, and the whole to have strong carriages complete; handrail to be put from the barn to the threshing-floor, as shown, with $\frac{3}{4}$-inch balusters, with three iron balusters, flanged and screwed complete: the handrails to be of Spey fir. The locks, bolts, and fastenings to be found by the proprietor; and the contractor will find screws, and fasten them on without any extra-charge for the same. The roof must be ready to receive the covering on or before the day of , and the whole of the works finished and completed on or before the

day of , or else the contractor shall and will allow the sum of £5 per week. as liquidated damages, for each week he may exceed the time allowed for being ready with the roof, for covering in, or for the completion of the works; and which sum or sums will be deducted from the balance due to the contractor, remaining in the hands of the proprietor.

1067. *Joisting.* All the wall plates to be 7 inches by 1 inch and a half. The sleepers in the dressing-barn (the part of the barn appropriated for dressing corn) to be 6 inches by 2 inches and a half, built in as described in the mason's work. The joisting of the barn and granary floors to be 10 inches by 2 inches and a half, with 1 foot of wall hold. The cart-sheds to have a joist 8 inches by 2 inches and a half, built into the wall at each pillar, and chacked to the lintling beams, 9 inches by 12 inches, and screwed to the same with a half-inch bolt, the other end of the same joist to be chacked to the wall plate in the same manner.

1068. *Doors.* The whole of the doors to be made of Tarlogie deals, not more than 6 inches wide, and 1 inch and a quarter thick, ploughed and beaded on the joists, with three $1\frac{1}{4}$-inch cross bars, and well nailed. The stable, byre, and barn doors to be hung in two leaves. The whole of the doors to be hung with crooks and bands; the crooks to be laid on the bed of the rybats; the crook to be split in the tail (in order to serve instead of a rivet), and to have 7 inches hold of the stone, and to be well batted (run) in with lead; the pin of the crook to be 1 inch and an eighth in diameter; each crook to weigh 3 pounds and a half. The bands to be 22 inches long, three eighths of an inch thick at the neck, and 2 inches broad, with $\frac{3}{8}$-inch screw-bolt to the neck of each; each band to weigh 4 pounds and a half. The band nails to have counter-sunk heads, and properly riveted; sunk ring latches to all the doors, and 8-inch stock locks to the granary, barn, poultry-house, milk-house, and coal-cellar doors only.

1069. *Windows.* The frames of the barn and milk-house windows to be 2 inches thick, and filled in at bottom with boards 16 inches high, hung to frames on cross-tailed bands, and glazed above with third crown glass; those in the granary, stables, &c., to be filled in with weather-boards 6 inches wide and 1 inch thick, chamfered on the outer edges, hung with iron pivots in a frame 3 inches by 2 inches, having a strap of iron attached to the inside, and movable up and down, to admit air when wanted.

1070. *Stables.* The hind posts of the trevises (partitions) to be octagons of 6 inches and a half in diameter above the pavement, and sunk in solid masonry, as shown in the section, fig. 1050; the part built in to be charred, and the tops to be rounded. The fore posts to be 4 inches and a half by 2 inches, the foot set in a stone; $1\frac{1}{2}$-inch trevise-boards to be mortised into the hind post, which must be set 8 feet from the front wall. The trevises to be 6 feet high at the front posts, and 4 feet and a half high at the hind posts; to have angle warpings (braces) 4 inches by 1 inch and a half, and to be nailed with double double nails (20*d.*). Mangers to be, as shown, of $1\frac{1}{2}$-inch Tarlogie deals. The under racks to be 2 feet 3 inches high, and to have a run beam 4 inches by 3 inches, rounded on the upper edge, with rings for fastening the horses. A piece of bond timber, 4 inches by 3 inches, to be built into the walls for harness-pins.

1071. *Gates.* The posts to be as the hind posts of the stables, and to stand 9 inches above the gates; the hinge post of the gate to be 5 inches by 4 inches; the front post, 4 inches by 3 inches; the angle spar, 1 inch and a half by 3 inches; the spars to be three quarters of an inch by 3 inches and a half; the top spar will be $1\frac{1}{4}$-inch square iron, with shoulder and eye at the hinge post, diminishing to three quarters of an inch square at the front post, with a screw and nut. The crooks to be put into the gate-posts with a screw and nut.

1072. *Sundries.* The linteling beams to the horse-course to be 12 inches square, and to be tied at the angles with iron straps 2 inches and a half by three eighths of an inch, and 20 inches long, and to be chacked together; the rafters to be 6 inches and a half, and 6 inches by 2 inches and a half, with 2 balks in height, chacked and spiked together with double garron nails, and mortised into the octagonal post at top 6 inches in diameter; $\frac{3}{4}$-inch square cat bars (a cat bar is an iron bar three quarters of an inch square, for keeping a folding-door fast when shut; it has a ring at one end for fastening to the wall with a staple, and is bent at the other end, so as to hook into the door by another staple on the inside) to all the two-leaved doors; to provide a seat and riser to privy, and a ventilator over the boiler in the milk-house.

1073. *Mason.* All the excavating will be done by the proprietor. The whole of the stones used to be from the quarry of Balnascarrish. The mortar to be made of good well-burnt English lime, and landed at Portmahomack, with sharp sand in the proportion of two parts of lime to three parts of sand, the whole being well tempered and beat before being used. The foundations to be laid with flat-bedded stones laid in regular courses, and to be taken in by regular scarsements (sets back) as shown in the sections; all the internal gables to be carried up to the roof; the sleepers to be laid and built into the

same, and the dwarf walls to be 14 inches thick. The walls to be built of the heights and thicknesses shown and figured in the drawings, and the whole to be beam-filled at the top. No wall to be at any time more than 3 feet higher than the other walls, until each wall has been raised to its intended height. The door soles (sills) to be laid six inches above the causeway (or pavement) outside; the soles of the stable, byre, &c., to be laid 3 inches above the same, and the whole to be beveled (sloped outwards) on the top.

1074. *Hewn Work.* All the external corners to be droved (tooled) with broached tails (a regular breadth on each side of the angle of the corner stones to be hewn smooth, and the remainder of the stone to be rough-hewn, like the rest of the wall). The rybats (reveals), soles, and lintels of the doors and windows to be droved, with broached tails; all the rybats and corners to be 2 feet long at least, and the inband rybats (headers) to pass through the thickness of the walls; all the skews and tabling to be droved, and the shed-pillars, arches, and the chimney-tops to be broached; the shed and gate pillars to be chamfered 3 inches on the angles.

1075. *Causewaying.* The whole of the stables, byre, sheds, &c., to be laid with whinstone set in sharp sand; the settles (gutters or channels) to have 2 inches fall in 10 feet; the stable channels to be 10 feet from the front wall, and the rise from them to the rack to be 5 inches. All the doors, windows, &c., to be saved with rough arches (to have discharging arches) over the same. All the spurs (lower stones of the raking part of the gable, called in England the summer stones) to be 2 feet and a half long each. The whole of the rough walls to be pointed and harled (roughcast) outside, and the whole to be pointed inside.

1076. *Plasterer.* To plaster the walls of the granary and the dressing-barn with one coat of plaster with pounded glass mixed in the mortar, to prevent vermin from getting in.

1077. *Painter.* The whole of the doors, windows, gates, and all exposed wood and iron work, to have three coats of oil paint, of a colour to be chosen by the proprietor.

Detailed Estimate of the Expense of erecting the Farm Steading of ———, referred to in the above Specification.

1078. *Mason.*

308 roods (36 square yards in each rood) rough walls of the standard thickness (2 feet), and harled .....
433 yards of causewaying with whinstone, laid in sharp sand.....
47 yards of paving with flags in the straw-house.....
365 superficial feet of droved hewn work (labour only) .....
200 superficial feet of broached do. (do. do.) .....
9893 superficial feet of run 4-inch tabling and skew stones; the materials only; the labour being included in the droved work.....
96 superficial feet of door and window soles and lintels, do. .....
16 lineal feet of vent .....
1 copper and furnace to set .....
21 posts built in solid work, 3 feet in diameter . .....
18 steps broached to the gangway to the granary.....
Tools, tackle, scaffolding, &c. .....

£ 274 : 10 : 0

1079. *Plasterer.*

417 yards of one-coat plaster ..... £ 14 : 5 : 0

1080. *Painter.*

428 yards of three-coat paint and knotting ..... £ 21 : 8 : 0

1081. *Carpenter.*

169 cubic feet in lintels, &c. .....
1227 yards of roofing and cabers (laths for thatch) .....
271 yards of flooring and joists .....
264 yards of 1¼-inch three-barred doors (ledged doors with 3 backboards) .....
193 yards of windows .....
56 yards of gates.....
43 yards of sleepers and flooring .....
45 yards of trevises, &c. complete.....
55 yards of racks, &c. .....
41 yards of do. in byre .....
75 yards of do. in cattle-sheds .....
93 yards of centres for arches .....

105 yards of paling in the fold-yard .....
15 yards of water-trough and pump .....
29 yards of shelves and divisions for nests in the poultry-house .....
10 feet superficial 1 seat and riser in the privy .....
61 feet superficial of stairs .....
57 feet superficial run bond timber, and harness pins .....
48 pairs of large crooks and bands .....
14 pairs of small cross-tailed bands .....
4 8-inch stock-locks .....
8 cat bands and socket hinges (see fig. 1059, p. 533.) .....
20 iron straps for the cart-sheds and horse-course .....

£ 457 : 8 : 0

1082. *Recapitulation.*

Carpenter	£ 457 :	8 : 0
Mason	274 :	10 : 0
Plasterer	14 :	5 : 0
Painter	21 :	8 : 0
Thatcher, about	55 :	0 : 0
	£ 821 :	11 : 0

1083. *General Estimate.* As the cubic contents of this farmery are 78,468 feet, the above gives 2½*d.* per foot as the data for forming guess estimates for the north of Scotland.

1084. *Remarks.* We have given the foregoing specification and estimate chiefly on account of some peculiarities in the details of construction, and of some local terms. The first twelve paragraphs were taken from a printed form, which, being applicable to specifications generally, is calculated to save the Architect a good deal of trouble. Such forms, both for specifications of buildings, agreements for leases, and even leases themselves, are often printed, in the case of large estates, for the convenience of the agents. The farm house to this farmery is remarkably small, and, with its chimneys in the gable ends, it has the usual commonplace air of Scotch farm houses; cold, formal, and comfortless. There is a privy in a recess off the stable, which is all exceedingly well for the men, but quite useless for the women, who ought, at least, to have had a similar convenience, equally private, near the byre, but by no means in it, as cows are, in relation to such places, much more delicate than horses. The barn here is remarkably well placed, connected, as it is, with the stables on one hand and the cattle-sheds on the other.

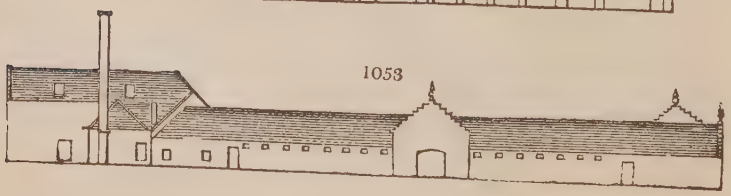
Design XXXIV. — *The Farmery at Greendykes, in Haddingtonshire, consisting of 500 arable Acres under a Six-Course Shift.*

1085. *Accommodation.* The general appearance is shown in p. 535, and the ground plan in fig. 1054. In the latter are seen an entrance gateway, *a*; two stables for eight horses each, *b b*; hen-house, *c*; two loose horse places, *d d*; a boiling-house, *e*; two cart-sheds, *f f*, with granaries over; the tool-house with stairs to the granary, *g*; gig-house, *h*; two riding-horse stables, *i i*; four cattle-sheds, *k*; potato-house, *l*; two cow-houses, *m m*; straw-barn, *n*; chaff-house, *o*; corn-barn, *p*; engine-house, *q*; boiler, *r*; coal-house, *s*; smithy, *t*; bailiff's house, *u*; open courts, *v*; piggeries, *w*; feeding-troughs, *x*; passage, *y*; and rick-yard *z*. Fig. 1055 is a plan of the roofs, and of those parts of the buildings which are two stories high. In this plan are shown the two granaries, *a*; boiling-house, *b*, hayloft to the riding-horse stables over the gig-house, *c*; barn, *d*; and chimney to the boiler of the steam-engine, *e*.

1086. *Construction.* The walls are of local freestone, and the roofs of Baltic timber, covered with slate. Fig. 1052 is an elevation of the west front, and fig. 1053 is an

1052

1053



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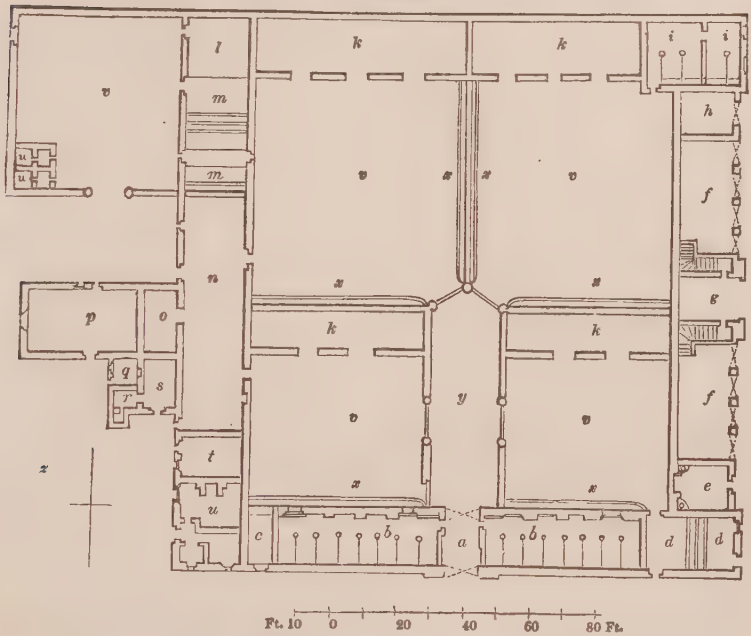
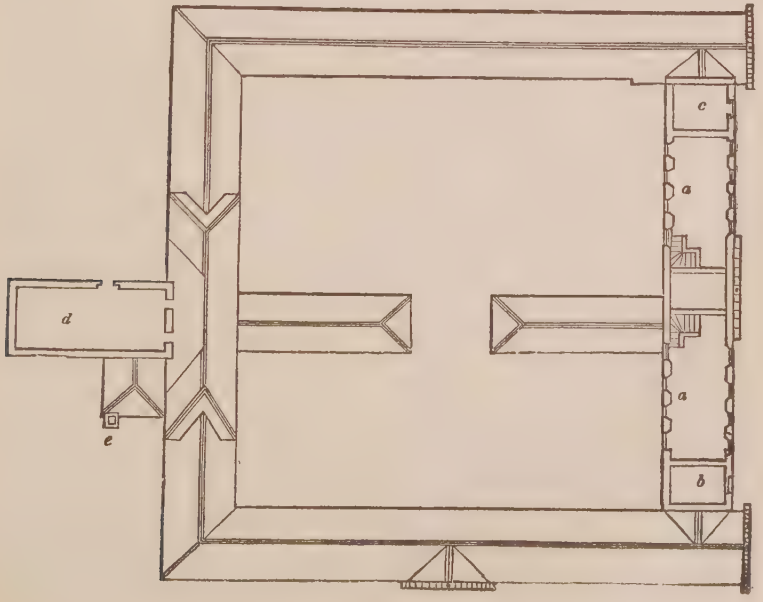


elevation of the north front. All the various details of construction will be found clearly set forth in the following specification: —

1087. *Specification of a Plan for building the new Farm Offices at Greendykes, near Haddington. — Foundations.* The foundations to be dug down until a firm and solid

1055

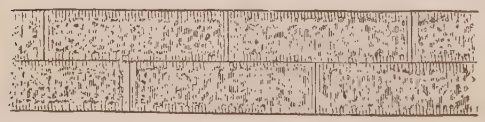


substratum is obtained for founding upon, and to be at least 18 inches below the level of the door soles (sills). The foundation to be laid with large flat-bedded stones on a bed of lime, and to be laid in 12 inches wider than the thickness of the walls, as figured in the plan, and to be reduced to their regular thicknesses at the surface level.

1088. *Rubble-work.* The whole of the walls to be executed of the best rubble building, with the stones laid all on their flat and natural beds, and properly hearted and packed (the interior filled in solid with mortar and chips) with well prepared lime and sharp sand; and all the joints to be clean, and neatly drawn in with the edges of the trowel, particularly the west elevation, which will be done in coursed work with the very best picked stones from Bangley quarry. The whole of the external elevations to be executed with new materials, and all the old stones to be used in the inside walls. All the gable tops (upper parts of the cross walls) to be carried close up to the slates.

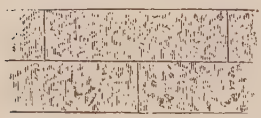
1089. *Hewn Work.* The whole of the corners, door and window rybats (reveals), soles and lintels, stair-steps, crow-steps (barge-stones rising above one another like stairs, see fig. 1053), balls and points (ornaments; see the figures), chimney-tops, skews, pillars and arches, and arches of cart-shades (cart-sheds), archways for the gateway and bailiff's house, the jambs and hearths, also the pavement in the riding-stable, gig-house, and at the stair foot, to be all executed in broached work, with droved margins (or draughted and broached; that is, worked round the joints with a chisel, about three quarters of an inch on the face, and the remaining part of the face, roughly done with a pick, as in fig. 1056: common broached ashlar is without the draughted or droved edges, and is simply dressed with the pick, or pointed or chisel edge of the hammer, as in fig. 1057) as will be directed.

1056



1090. *Heelpost Stones.* The stable posts, and posts in front of the feeding-troughs, to have heel-stones 12 inches square and 18 inches long, properly squared, and droved on the top; with a hole for receiving the posts 2 inches deep.

1057



1091. *Causewaying* (*Paving*). The stables, loose-house (stable or place for a sick horse, mare and foal, cow about to calve, &c.), byres, and piggeries to be all neatly causewayed (paved) with good rubble causeway; and all these apartments to have proper declivities and channels for carrying off the water into the open courts.

1092. *Wall Coping.* The walls in the open courts to have semicircular hammer-dressed (dressed with the chisel end of the hammer) freestone copes (coping), and the tops of the pillars or piers to the gateway openings to be finished with a square plinth and semicircular droved stone; the top stones (the course of stones immediately under the coping) to be in single blocks.

1093. *Troughs.* The feeding-troughs to be built up solid with stone and lime to a proper height; and the soles to be laid with droved pavement close joined, and not less than 3 inches thick.

1094. *Engine-house.* The engine stalk (shaft or chimney) to be carried up with brick from the level of the wall heads to the height of 45 feet from the level of the engine-house floor. The flues to be 20 inches square inside, and the sides of the flues to be built with quicklime, and the floor of the engine-house to be laid with clean droved pavement. A tunnel to be built for the engine 10 feet long, 6 feet deep by 2 feet 3 inches wide, the sides and ends of the tunnel to be built with rubble-work 2 feet thick, and lined upon the face with droved ashlar, and the bottom to be laid with droved pavement. The tradesman to build in the boiler for the engine, and to furnish what fire and other bricks may be required for that purpose. The whole of the external corners of the pillars of the cart and cattle sheds to be neatly rounded.

1095. *Corn-barn.* The floor of the corn-barn to be sunk down 15 inches deeper than the level of the door sole, and dwarf walls built every five feet apart, and 12 inches thick, for supporting the sleepers; the whole space below the floor to be filled up close to the under bed of the flooring, with small broken stones, and to be run full of thin grout lime, on purpose to prevent vermin from getting through the floor.

1096. *Stables.* The wall heads of the stables, corn-barn, granary, hayloft, and cow-house to be beam-filled close up from the top of the walls to the roofs. Recesses are to be left in the stable wall behind the horses, seven feet high, as shown by the drawing, for the reception of the harness, and of the corn-chest.

1097. *The Ventilators* to be put through the front wall of the stable, as shown by the

plan, 6 inches square, with a droved hewn stone on the outside of the wall 16 inches square, with a 6-inch hole cut through it to ventilate the stable.

1098. *Servants' Houses.* The vents (chimneys) of the servants' houses and boiling-houses to be carried up at 11 inches square inside, and to be properly plastered.

1099. *Stonework generally.* In building the pillars for the gates to the open courts, proper care must be taken that large weighty stones be put at their proper places for fixing in the iron crooks. The tradesman to get the old stones at Greendykes and Arniston which will be pointed out by Mr. C. The tradesman will also furnish the whole of the other stones, and the lime that will be required for finishing the building; the hewn and rubble stones are to be taken from the Jerusalem quarry, the whinstones for the west front from Bangley, and the pavement from the quarries at Salton limeworks. All to be of the best quality the several quarries will produce; and Mr. C. to furnish the whole of the carriages of every description; but the tradesman must take down and clear out the old stones, and prepare them for carting, and also furnish bricks for the engine vent of the best quality.

1100. *Carpenter's Work.* The soles and lintels to be 3 inches thick, with a wall-hold (their ends deeply inserted into the wall) on each end of the head and sill of the frames, 9 inches in length, and of width sufficient to fill up the space required. The whole of the joisting for the granary and barn to be 11 inches by 2 inches, and 16 inches apart, with a wall-hold on each end of 9 inches; and the joisting to be laid on wall plates 7 inches by 14 inches. The joisting over the mill-loft (floor for the unthreshed corn, from which, being fed into the upper part of the machinery, it comes out separated into corn and straw, in the floor below) and granaries to be covered with a flooring of boards not exceeding 6 inches and a half broad, and 1 and one eighth of an inch thick, and to be ploughed and tongued on the edges. Two strong joists to be in the mill-loft, 11 inches by 6 inches, and three cross framings of the same size on each side of the shaker, and one at the spur-wheel (a wheel on the main shaft with the cogs or teeth standing outwards, which operates on a pinion), as shall be directed by the millwright.

1101. *The Corn-barn* to be laid with sleepers and flooring; the sleepers to be 5 inches by 2 inches and a half, and 16 inches apart; the flooring to be the same as above specified; the wall-plates below the sleepers to be 7 inches broad by 14 inches thick.

1102. *Roofing.* The scantling for the roofing to be 6 inches at bottom by 5 inches at top, by 2 inches and a half thick, and placed 18 inches apart. Wall-plates to be 7 inches by 1 inch and a quarter; baulks (tie or collar beams) to be 6 inches by 2 inches and a quarter. The sarking to be three quarters of an inch thick, and close-jointed on the edges. The flank-trees (valley rafters) to be 7 inches at bottom and 6 inches at top, by 3 inches and a half thick; and the pien-trees (hip rafters) to be 7 inches broad and 2 inches thick. The partition in the corn-barn to be of standards (quarters) 4 inches by 2 inches, 18 inches apart, and covered on one side with deals a quarter of an inch thick, clean-planed, beaded, grooved, and tongued on the edges; with a door through to the chaff-hole. A trap-stair and wood-rail to be put up to the same, and round the opening at the landing from the corn-barn to the mill-loft. There is to be also a wooden trap from the straw-barn to the mill-loft, 2 feet wide, and of proper strength for carrying up the refuse from the shaker. There are to be two skylights put into the roof of the mill-loft, 3 feet long by 2 feet wide, for giving light to the machinery; and these are to be glazed, having flashings of lead round the slates weighing 4 lbs. and a half per foot.

1103. *Working-Horse Stables.* The working-horse stables to be fitted up with racks and mangers, and trivess boarding. The trivess boarding to be 7 feet high in front, and 8 feet at the back end; with hard-wood (oak, ash, elm, &c.) coping on ditto. The top of the coping to be 2 inches and a half by 2 inches, and the boarding to be 1 inch and a half thick, and doweled on the joints. The mangers to be 10 inches wide at bottom, and 14 inches wide at top, by 10 inches deep, and the boards 1 inch and a quarter thick. A breast-tree (horizontal rail) to be put in front of the manger, 4 inches by 2 inches and a half, rounded in front. This tree to be of oak, with proper iron rings and staples for fixing the horses. The rack sides (top and bottom rails) to be 4 inches by 2 inches and a quarter, and to be fitted in with turned rack staves, 2 inches in diameter, with a rail 6 inches broad, opposite each trivess, and the rack staves to be made of beech; the back posts of the trivesses to be made of oak 6 inches square, rounded on the angles, and mortised into a run-tree (a rail fixed along the tie-joists) at top, and let 2 inches into the stone at bottom; the front posts to be 4 inches by 2 inches and a quarter, and one on each side of the trivess to be rounded on one side. There are to be 16 tie-joists across the stables, 7 inches by two inches and a half; and clean-planed for fixing the run-tree. The run-tree to go the whole length of the stable, to be 6 inches by 3 inches, and clean-planed. There are to be a sufficient number of harness-pins and saddle-trees put up behind the horses and on the posts.

1104. *The Riding-Horse Stable* to have a manger the same as the other stables, with circular racks in the angles. The stable to be divided in the middle with a deal partition 2 inches thick, clean-planed, beaded, and doweled on the joints, with a door of communication formed in it. The door-framing to be 4 inches by 3 inches; the door to be hung with strong cross-tailed hinges (strap hinges with a cross, sometimes shaped like a trefoil at the tail), and to have a sunk thumb sneck (a latch with the handle sunk flush with the surface of the door), the partition to go the whole way up the height of the ceiling. The front wall to be lined up with $\frac{3}{4}$-inch deal from the top of the manger to the top of the rack, and to be planed, grooved, tongued, and beaded.

1105. *Stable Arches.* Elliptical arches to be put across between the back posts and over the horses, with neat wood impost mouldings at the springings; and a thin plate of wood bent round the soffit of the arches.

1106. *Trivess* (*Partition*) *Boarding.* The trivess boarding to be of the same height and thickness as in the other stables, and finished on the top with an ogee and sweep, and hard-wood cope. The joists to be of the same materials, and the workmanship the same as in the other stable. The stone wall next the west front to be lined with 1-inch deal, and finished the same as the other trivesses. The ceiling to be lathed from the beam-filling, round the couples, and back; and the whole walls and ceiling to be finished with three-coat plaster. There are to be two wood pipes made 6 inches square, to go up through the ceiling, and 2 feet through the roof above the slates; with a flashing of lead put round the pipes to cover their joining with the slates. The 2 feet of pipes above the slates to be bored full of holes on all the four sides, and covered on the top with a moulded capital, on purpose to ventilate the stable. The bottom of these pipes to project below the ceiling of the stable, on purpose to admit of a shifting board to shut them up when required.

1107. *Poultry-houses.* A wooden stair to be put up from the turkey-house to the hen-house, as shown by the plan; and this hen-house and the hayloft to be joisted and floored with the old materials, &c. The stair to be covered in round the sides up to the ceiling in the turkey-house, and a door to be put up on the foot of the stair to keep the two places separate. The hen-house to be fitted up with a wooden roost, and nests on the north and east sides; and the tops of the nests to be covered with a sloping thin deal cover, on purpose to keep them clean from the roosts. The ceiling of the hen-house to be lathed from the top of the walls, round the couples (rafters), and back; and to be finished with two coats of plaster; and the walls both of the hen-house and of the turkey-house to be plastered with one coat of plaster. A skylight to be put in the roof of the hen-house, 3 feet by 2 feet, glazed, and made watertight with flashings of lead.

1108. *Doors.* The doors to be plain deal, and 1 inch and one eighth thick; the boards to be 6 inches and a half broad, and ploughed, tongued, and beaded on the joints, with three bars on the back of each; to be all hung with strong cross-tailed hinges (hinges like fig. 1058, which, of course, can only be used where there are wooden door-frames, or hanging posts, on which to nail the tail part, *a*, of the hinge) with an iron bolt through the neck, *b*, of each; except the doors for the straw-barn, which are to be hung with strong crook and band hinges. The door-frames to be 6 inches by 2 inches and a half, and strongly batted into the cheeks of the rybats; the whole to have keeps (stops) three quarters of an inch thick, and of proper breadth.

1058

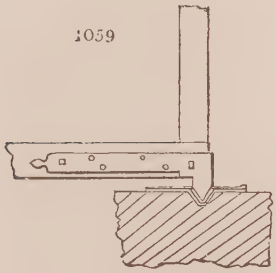
1109. *The Servant's* (*Bailiff's*) *House* to have a lath and standard partition on both sides, and two doors inside, 1 inch in thickness, with hinges and sneck (thumb latch).

1110. *Glazier's Work.* The windows of the stables and byres to be glazed on the top half; the under half to be made to open with boards, and hinges and snecks. The sashes to be 2 inches thick, with proper facings, keeps, and frames. The windows of the riding-stable, boiling-house, servants' house, corn-barn, engine-house, potato-house, and turkey-house to be made with sashes and cases; and to be glazed with good crown glass. The whole to receive one good priming coat of white lead before being glazed.

1111. *The Beams* (*Lintels*) *for the Cattle Sheds* to be 12 inches by 6 inches; to be all clean-planed on the front and under sides, and to have 12 inches of wall-hold on each end.

1112. *The large Entrance Gate* to be framed with $2\frac{1}{2}$-inch wood; styles 6 inches and a half broad, with cross rails 9 inches, and cross angular (diagonal) braces to the same, to be covered on the face with 1-inch deal grooved, tongued, and beaded on the joint, and to be made in two leaves; a wicket door to be in one of the leaves, to be framed in a similar manner. The gates to be hung with centre-point hinges at the bottom, and crook and band hinges at the top; and fixed at top and bottom with a very strong sliding bolt, and large thumb sneck. (Centre point, or swing hinges, appear to be of two kinds; one with the pivot of the hinge turned down, to work in an iron socket let into a stone,

as in fig. 1059; the other with two pivots, working on two hooks, as in fig. 1060, in which *a* is the hanging style of the gate, with the double pivot hinge attached, *b b* being the pivots; *c* is the hanging gate-post; and *d d*, the two pivots leaded into it. The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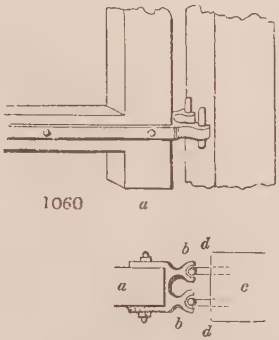


object common to both is, to make the point of rest of the gate the same as the shutting point; that is, the line in which the gate remains when it is shut.)

1113. *The Gig-house Door* to be made with 1¼-inch deal, with three bars across each half, 1 inch and a half thick, and with angular braces; to have hinges and bolts of a proper strength, the same as the large gate, and a good stock lock and sneck. This door to be made with an opening three quarters of an inch wide between each deal (board), for the admission of air, the deals not being more than 6 inches broad.

1114. *The Byres* to be fitted up as shown in the drawings; the sole trees to be eight inches by four inches; the top tree six inches by three inches; and the stakes to be of hard wood.

1115. *The whole of the Doors* to have good and sufficient locks, bars, and bolts, where necessary; and all to have strong Scotch-made thumb snecks, with folding handles (handles to hang down, or fold aside) to the same.

1116. *The Gates* for the open courts to be hung on two leaves, and framed with 1½-inch thick framing and angle braces; and to be covered on the outside with 1-inch thick deal, ploughed, tongued, and beaded on the joints; and finished on the top with a cope 1 inch and a half thick. The gates to be hung with strong crook and band hinges (in fig. 1061, *a* is the band, and *b* the crook; the former is used in the case of boarded doors, which have no hanging styles; the latter is either leaded into stone, or sharpened and driven into wood), and the hinges to be made so that the gate may open on the outside, and fold back to the court walls; and be fixed together, when shut, with a hardwood swivel bar, and iron bolts and staples of sufficient strength.

1117. *Granary Windows.* The windows of the granary to be fitted in with wooden frames and round iron rods three eighths of an inch in diameter, and three fourths of an inch apart. The frames to be 2 inches and a half broad, and 2 inches thick; the sole for the frame to be 3 inches and a half by 2 inches and a half, and to be washed off (sloped) on the outside to carry off the rain. There are to be inside shutters five eighths of an inch thick, ploughed, tongued, and beaded on the joints, with a water verge on the bottom (a slip nailed on, to throw off the rain), hinged on the two halves, and fixed inside with a cross shifting hard-wood bar, and iron staples. There is to be a standard and deal partition put round the top of the stair in the granaries 3 feet high. Standards 3 inches square, and the boarding 1 inch thick, ploughed and tongued.

1118. *The Hayloft* to have a door 1 inch thick, with frames, hinges, and folding thumb sneck; the openings for putting the hay down to the horses to have doors three fourths of an inch thick, with frames, hinges, and bars; there is to be a light movable trap-ladder to go up to the hayloft by the front door of ditto; and saddle-trees and pins to put up in the stable.

1119. *The Gig-house* is to be lathed on the ceiling, and to be finished on the walls and ceiling with two coats of plaster. The floors of the straw-barn, servants' house, potato-house, turkey-house, chaff-hole, and boiling-house to be all laid with a composition of lime, sand, and engine ashes (coal ashes), three inches thick; to be laid on in due proportions, and properly rubbed and smoothed on the surface. Frames of wood

are to be fixed to the inside of the front wall of the cart-stable, opposite the openings of the ventilators, with shifting boards, to slide and close them as may be required.

1120. *Beams.* Two strong Memel planks will be required in the engine-house, to be built into the walls, and to be 9 feet long and 12 inches by 5 inches on the sides, for fixing part of the machinery.

1121. *Plaster-work.* The working-horse stable, granaries, corn-barn, and mill-loft to be finished with one coat of plaster on the walls; and the corn-barn, mill-loft, and granaries to have a skirting of Roman cement 8 inches round the floors.

1122. *Slaters' Work.* The roofs to be covered with the best dark blue slate, from Mr. Bell's quarry near Dunkeld; to have a sufficiency of cover, to be well shouldered in haired lime (the lower part of each row bedded in lime); and to be nailed on with nails at 12 lbs. per thousand, well steeped in linseed oil when in a heated state (to prevent, or at least diminish, oxidation); the slates to be all close-mitred (when two planes meet against a diagonal line, they are said to be mitred) in the angles of the flanks.

1123. *The Ridge* to be covered with lead 12 inches broad, and weighing 5 lbs. per superficial foot; the piens (hips) with lead 10 inches broad, and 5 lbs. per superficial foot; and the flanks with lead 8 inches broad, and 5 lbs. per superficial foot, to be all properly dressed down to the slates, and firmly nailed to the wood battens.

1124. *Description of Timber.* The timber for the roofing, joisting, sarking, soles, lintels, sleepers, gates, windows, trivess-boarding, racks and mangers, beams, and sole and top trees, feeding-troughs, &c., to be all of the best Memel timber, and all the flooring and doors, &c., to be of drawn (selected) battens.

1125. *Feeding-troughs.* The front of the feeding-troughs, in the open courts, to have a plank of wood 9 inches by 3 inches set on edge; and to have a post every 10 feet 4 inches by 3 inches, and put 2 inches into a stone in the bottom, and fixed at top with a long strong iron bat (stud) fixed into the stone sole, and a large screw-nut on the outside of the posts. The planks to be all fixed to the posts, with two iron screw-bolts into each.

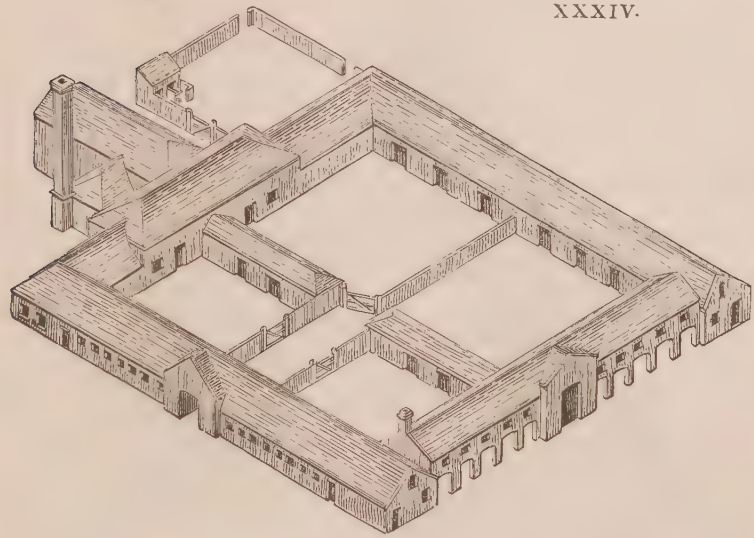
1126. *The Tradesman* to furnish the whole of the material and workmanship, as particularised in the foregoing specification. Also the sea carriage of the slates, which must be shipped to the harbour nearest Greendykes, and Mr. C. (the tenant) will furnish the whole of the land carriage.

1127. *The whole Work,* of every description and kind, must be finished in the most substantial and workmanlike manner, and be liable at all times to the inspection of the proprietor, or Mr. C., or any other person they may choose to appoint for that purpose. The carpenter to furnish all the centring and moulds for the mason-work.

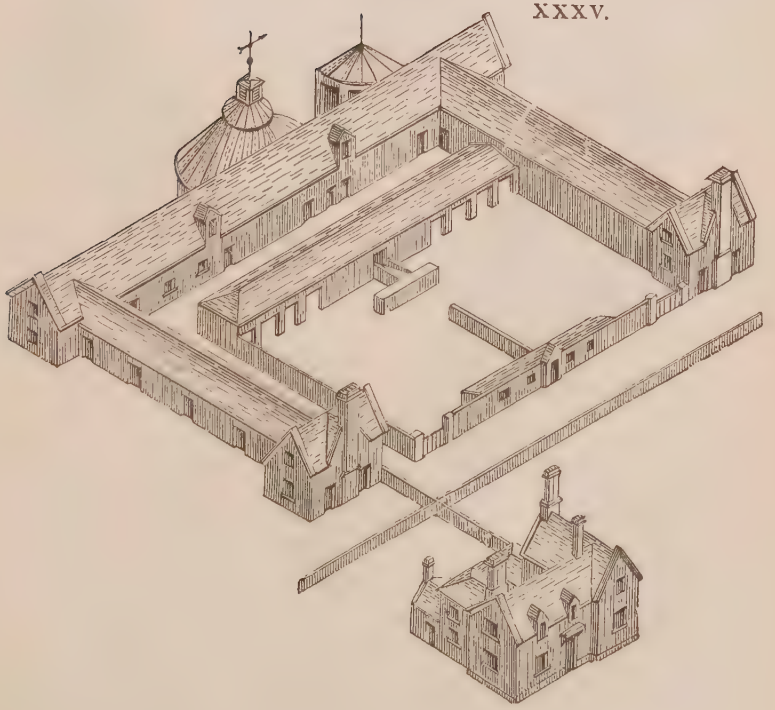
1128. *Estimate.* The actual cost of this building, exclusive of the old materials, and the expense of carriage, was about £2000; but it is estimated that if all the materials had been new, and the carriage had been included, the total amount would have been £3000; which, at 6 per cent, would have been equal to an addition of £180 a year to the rent of the farm. The expense of the farm house is not included in either of the above sums; but as that for such a farmery would cost nearly £700, this, at 6 per cent, would give at least £200 a year of additional rent, or 12*s.* an acre. The total number of cubic feet in the farmery, including court and fence walls, is 208,600; which gives $2\frac{1}{4}d.$ per cubic foot as the guess price for estimating buildings of this description in East Lothian.

1129. *Remarks.* This Design was procured for us by our much valued contributor, Patrick Shirreff, Esq., of Mungoswells, near Haddington, well known as one of the most scientific farmers in Scotland, as a specimen of one of the best farmeries in East Lothian. It was designed by —— Swinton, Esq., Architect, Haddington; and built, under his superintendence, at Greendykes, for David Anderson, Esq., of St. Germains. It will be observed that, considering its extent, the courts or fold-yards are fewer in number, and smaller in size, than those of the Northumberland Designs; and that there are none of these courts which are entitled to the appellation of hammels or fold yards. Hammels, indeed, Mr. Shirreff informs us, are out of repute in East Lothian; that is, what are called hammels in Berwickshire, which differ from those of Northumberland in being much smaller. "My idea of a hammel," says Mr. Shirreff, "is a range of shed-buildings divided by parallel partitions from ten to twenty feet asunder, and projecting beyond the building, so as to form courts two or three times the size of the space included within the building. Such hammels, within long narrow open courts, have gone out of use in Haddingtonshire, and in Scotland generally; and justly so, on account of the expense of littering them, supplying them with food, and removing from these long narrow spaces the accumulated manure. To a farmer who fattens short-horned cattle, so tame that several of them may be put together in a very small space, hammels may be of use; but where, as with us, young active cattle from the Highlands and other northern districts are put up to feed, it is often a month or more before only two or three cattle, bought

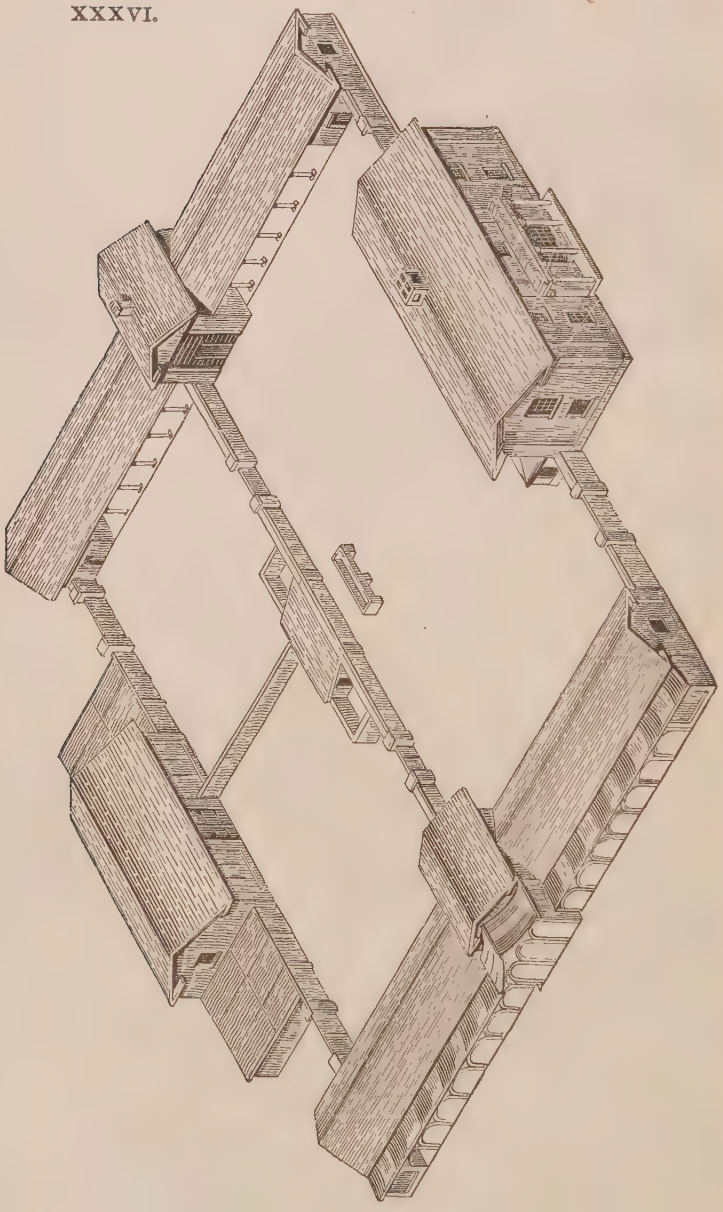
XXXIV.



XXXV.



XXXVI.

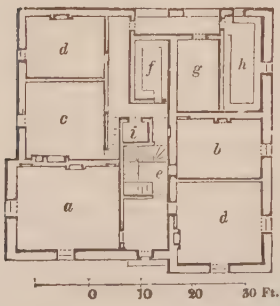


promiscuously in a market, agree when put together into a hammel; and the loss, in consequence, is often considerable. In the neighbourhood of Haddington, there was a set of excellent hammels erected about fifteen years ago, but open sheds with large courts are now substituted for them. Well sheltered courts are almost every where employed, in Haddingtonshire, for fattening cattle; but it must be remembered that with us, it is generally a difficult matter to convert straw into manure, from the abundance of it, and the dryness of the climate." The ample details in the specification of this Design will give a very complete idea, to the Architects of other districts, how farm buildings are executed in the first agricultural district in the island; and they cannot fail to observe the substantial and durable nature of the materials and the workmanship employed. There are two or three minor conveniences and comforts which we could wish to introduce; and that prominent feature, the chimney to the steam-engine, might, we should hope, be placed centrally with reference to the range or side to which it belongs. But, whether the shaft of the steam-engine can be placed centrally or not, we sincerely hope that the landed proprietors of Scotland will not suffer their country to be disfigured with the inelegant forms of engine-chimneys, which have hitherto been erected in those farmeries where steam has been adopted. We have little doubt that it will soon be preferred to either horses or wind, on all large corn farms on every part of the island. Tall engine chimneys, therefore, promise to be as common in the corn districts, as they are now in Lancashire, and we have only to point out the latter as beacons to be avoided. Under the head of Exterior Finishing of Farmeries, in Section III., we shall give some to be imitated. Since it is so difficult to turn straw into manure in East Lothian, we could wish to see all that is used for fodder cut into chaff, and mixed with succulent food, salted and watered; and we could wish also to see the liquid manure collected in tanks, and pumped up daily, or twice a day, and distributed over a covered dunghill, in the manner which has been already described, § 1019. It will, no doubt, be considered presumptuous in us to find fault with any agricultural practice prevalent in East Lothian: let it be recollected, however, that great improvements have, within the last twenty years, taken place even in this district, and that farther advances may be made. The dryness of the atmosphere appears to us a strong argument in favour of covering the dunghills, as well as of collecting liquid manure to moisten them; and feeding horses and cattle with cut straw and some liquid food, in order, among other advantages, to increase the quantity of liquid manure. It will be observed that several local terms are spelt differently in this specification from what they are in those of Mr. Newall, § 907, Mr. Green, § 979, Mr. Ross, § 1053, and even the Committee of the Highland Society, § 1200. We have deemed it better to give the spelling, in each specification, as we received it, hoping to be able to discover and insert that which is preferable, and also to generalise many of the local terms in the Glossarial Index.

Design XXXV. — *A Farm House and Farmery at Elcho Castle, Perthshire, adapted for a Farm of Six Ploughs, under the Turnip Husbandry.*

1130. *The General Appearance* is shown in the isometrical view, page 535; the ground and chamber plans of the house in figs. 1062 and 1063, and the ground plan of the farmery in fig. 1064. Figs. 1065, 1067, 1068, and 1069 are geometrical elevations.

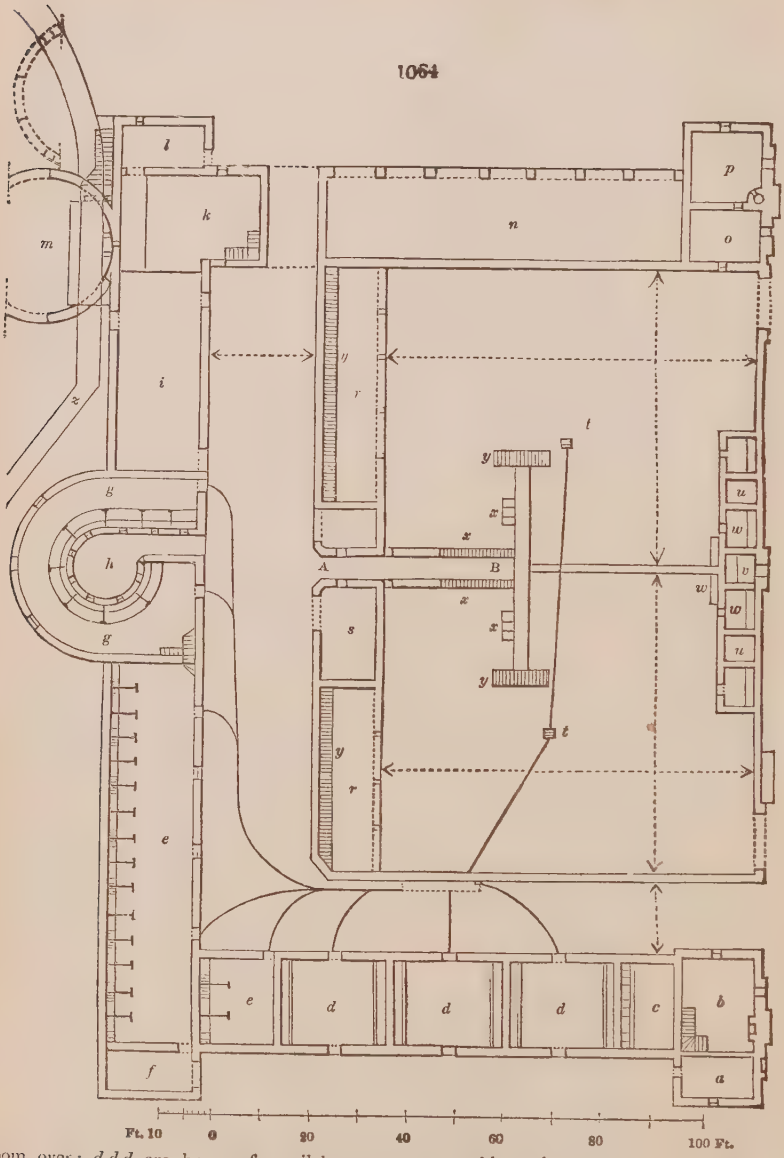
1062



1063

1131. *Accommodation.* The ground plan of the house, fig. 1062, shows two parlours *a a*; a family bed-room on the same floor, *b*; kitchen, *c*; wash-house, *d*; lobby and staircase, *e*; pantry, *f*; coal-house, *g*; dairy, *h*; and cellar, *i*. The chamber floor, fig. 1063, contains four good bed-rooms, *k*; and a servant's bed-room, *l*. — In the farmery, fig. 1064, *a* and *c* are poultry-houses; *b* is a boothy, or single men's lodge, with a bed

1064

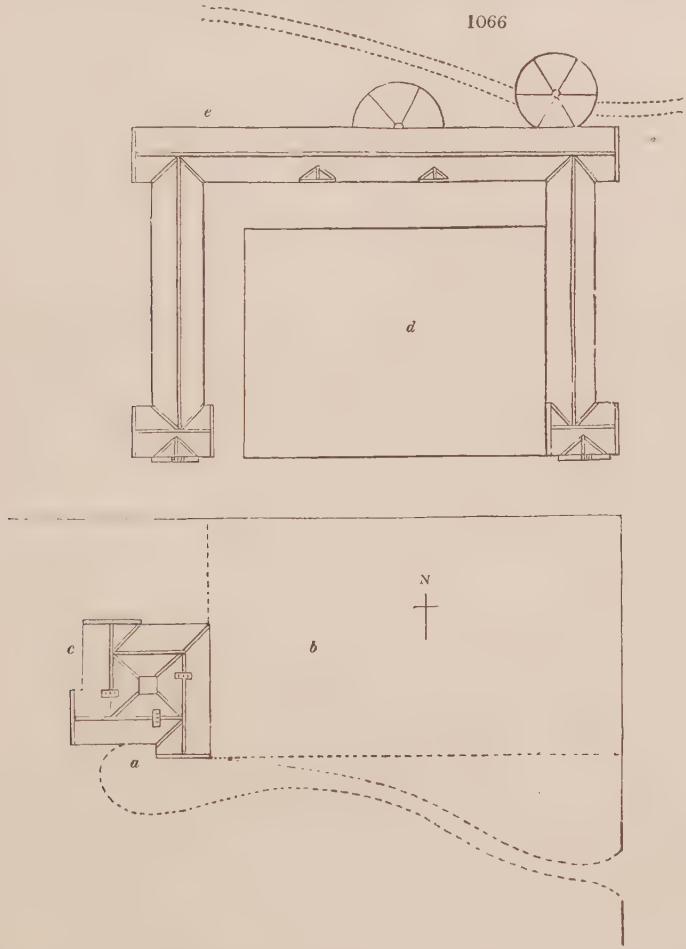


room over; *d d d* are houses for milch cows; *e e e*, stables, with hay and straw lofts above; *f*, house for grass, or other green food for the horses; *g*, house for feeding cattle; *h*, feeding-chamber; *i*, straw-house; *k*, corn-room; *l*, chaff-house; *m*, mill-shed; *n*, cart-shed, and granary above; *o*, potato-house; *p*, boiling-house; *r r*, cattle-sheds; *s s*, turnip-houses; *t t*, straw yards; *u u u u*, piggeries; *v*, water-cistern; *w w*, water-tank; *x x x x*, turnip cribs or boxes; *y y y y*, straw racks, and *z*, watercourse for driving the water-wheel of the threshing-machine, when water is abundant.

1065

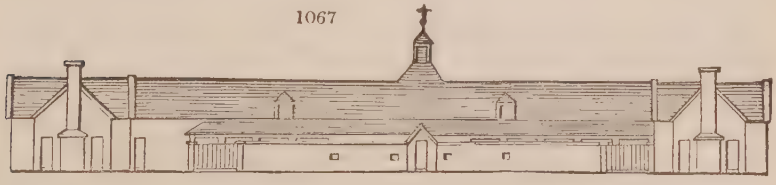
1132. *Construction.* The walls are of stone, eighteen inches thick, and those of the barn, and of all the other buildings of two stories, two feet thick at the surface of the ground, and eighteen inches at top; the roofs are covered with slate. Fig. 1065

1066



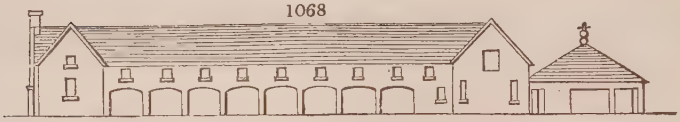
is a front elevation of the farmer's dwelling-house. Fig. 1066 shows the position of the house relatively to the farmery, in which *a* is the house; *b*, the kitchen-

1067



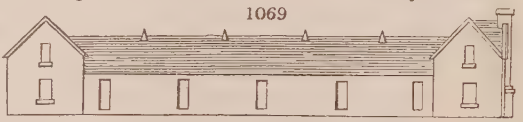
garden; *c*, a grass field planted with fruit trees as an orchard; *d*, the farmery; and *e* the rick-yard. Fig. 1067 is an elevation of the farmery from the south. Fig. 1068

1068



is an elevation from the east, and fig. 1069 is a west elevation. Other particulars of construction will be found in the following descriptive particular, sent by W. M. Mackenzie, Esq. Architect, the author of the Design: —

1069



1133. *The Situation* fixed upon was nearly level, and the straw-yard was cut out hollow in the centre, of a basin figure, that form being most advantageous for retaining the moisture among the manure.

1134. *In the General Arrangement*, the highest of the buildings front the north and east, as best suited for the purposes to which those parts of the steading are to be applied, and at the same time adding to the comfort of the cattle in the sheds and straw-yards, by sheltering them in the directions which are generally the coldest. The pigsties on the south, and the byres, &c., on the west, being low buildings, do not shade the straw-yard and cattle-sheds, but admit the rays of the sun to all parts of them. The farm house is situated on the south-west of the steading with the kitchen court adjacent to the cow-byre, calf-ward, &c.; thus keeping the offices which are managed by the house servants in the one division, and those under the management of the farm servants in the other division, of the establishment.

1135. *The Threshing Machinery* being placed in a corner of the square, discharges the threshed corn into the clean-corn room, in the direction of the granary which occupies the upper story of that side of the square, and the straw is thrown from it into the straw-house, which is in the direction of the straw chambers, over the feeding-byre, stables, &c., on the other side of the square. By this arrangement the clean-corn room communicates with the granary, which comes three feet over it, and extends from this point over the cart-shed and boiling-house. In this three feet of the granary which comes over the corn-room is placed a trapdoor, through which the sacks are drawn up by means of a wheel and axle, and are then placed in a miller's barrow, and wheeled into the granary. In this way the clean-corn room occupies a side of the square apart from the offices allotted for the bestial (beasts), and other apartments connected with them; and, as the corn-room can be locked up the moment the operation of threshing is finished, no opportunity is left for the grain being pilfered or injured. The granary, in this situation, has not only the advantage of the ventilators in the side walls, but it has also the benefit of the free air in the open cart-shed under it, which acts upon the grain through the joints of the floor. The cart-shed under the granary, besides being beneficial to it for air, is convenient, particularly where a farm is situated at a considerable distance from a market town; or, in the winter season, when the carts are required to be loaded on the evening preceding the market day, as it can be done before yoking, and without moving the carts from under their cover, by means of the trapdoor in the centre passage of the granary, which passage is at all times kept clear from grain. In the straw-house a trapdoor is placed over the straw-rack, and when the lower part of the house is packed full, this trapdoor can be shut, and the straw carried along the upper floor to the straw-chambers over the stables and feeding-byre. These apartments will contain the straw of three large ricks, which will enable the farmer to keep different kinds under cover, and in separate divisions. A door five feet square is placed opposite the passage which extends along the centre of the straw-yard for taking out straw for the cattle-sheds, cow-byres, &c., if at any time required, but in general these are supplied from the low straw-house. The threshing-machine is one of six-horse power, and is impelled by water, but is so planned that horses can be employed if the water run short: in this Design, however, the horse-shed is not executed.

1136. *The circular Feeding-byre*, which will contain eighteen cattle, is by far the most commodious and convenient arrangement for a farm of this extent. The figure of the stalls being broad behind gives more space for the cattle when lying; and, as a greater quantity of bedding (litter) is requisite, more manure, of course, will be made; at the same time admitting a more abundant supply of fresh air, by having the advantage of one large ventilator in the centre of the circle serving the whole. The eighteen cattle are put up in double stalls in pairs; they are bound up one on each side of the travis (partition, probably from *traverser*, Fr. to cross), which is made high enough to prevent the horned

cattle from touching one another, at the same time keeping the heads of each pair at such a distance apart as not to be able to injure, or eat, one another's turnips. The bands are fixed to upright iron rods about three quarters of an inch in diameter, which are screwed together through the travis. The lower part of the windows in the back wall of the byre are filled with louvre (luffer) boarding, which can be opened to any degree for admitting air, or shut altogether, at pleasure. The feeding-ports (openings), which surround the feeding-chamber, have small doors hung with pulleys, lines, and weights, similar to a common window, which by moving upwards, do not interfere with, or occupy, any part of the feeding-chamber. The wall at the cattle's heads, surrounding the feeding-chambers, is built to the full height of the joists, which keeps the turnip-barrow out of the view of the cattle, and does not disturb the one division of them while the man is in the act of feeding the other. This is important, as the quieter the cattle are kept the better, quietness being no doubt essential to quick fattening.

1137. *A commodious Straw-chamber* is got over the byre, in a connected range with the straw or hay chamber over the stable; the roof, which is of considerable height, serving the double purpose of covering the feeding-byre, and containing a very large quantity of straw immediately over it. Racks are placed over the several stalls, which are filled from the straw-chamber above. By this arrangement, the cattle have it in their power to eat straw and turnips alternately, if inclined. The access to the straw-chambers over the byre and stables is by a stair which is common to both, and upon the plate (first landing-place) of the stair is placed a door, which divides the stable from the feeding-byre; the upper flight of the stair is understood to be a hanging one, leaving a useful space under it for holding the byre implements. By the whole arrangement half the labour of feeding and attending the cattle will be saved.

1138. *The Stabling* consists of eighteen stalls, three of which are separated from the general farm stable, but are so situated as to admit of the racks being supplied from the general straw or hay chamber over the common farm stable. They are understood to have two sets of racks; the upper one for hay or straw, and the under one for grass. Although the under racks appear the most natural for the horses to eat from, it is found that they do not eat the straw or hay so clean out of them as they do out of the upper racks; but these under racks are the most convenient for the grass, as it should always be put in from the stall below, without passing through the hay-chamber; being, in its damp state, very hurtful to the wood floor above.

1139. *The Turnip-shed*, which is right opposite the feeding-byre, is also conveniently situated for supplying the cattle in the straw-yard; and, as it is not required for turnips in summer, it may be used for, and serve the double purpose of, a grass-house.

1140. *The Cow-byres* have ventilators placed over each line of heads; they cross the ridge, and are formed of lead of a triangular figure, the sill-piece being overlapped by the sides far enough to prevent the rain from getting in. The calf house and ward, and the cow-byres, which fall under the class of offices more immediately connected with the house, have doors facing the kitchen court, which makes the access to them convenient and clean. The opposite doors are used for driving out the cattle, and for wheeling the dung into the straw-yard. The causewayed court in front of the byres, besides being convenient for carting in the turnips, affords space for the cows to move about in, or to stand in for a short time; and, as the cattle always make dung when they are driven out, by allowing them to remain for a few minutes in this passage or court, the dung that might otherwise be wasted on the roads is preserved, and thrown into the straw-yard.

1141. *The several Drains* leading from the byres, stables, and straw-yard have such declivities as to discharge the liquid manure into the tank, which is constructed on one side of the straw-yard, in a central situation for the byres, stables, &c. It is twenty-one feet long, five feet broad, and seven feet deep; and, if the nature of the soil be porous, it should be plastered over with Roman cement, to prevent the thin liquid manure from escaping. Being of this long and narrow figure, the tank can easily be covered with pavement, which is much cheaper than arching, and takes up less space. The drains should have cast-iron plugs placed at about fifteen feet apart, and at these openings a jointed rod fifteen feet long could be put into the drain with a hough (hoe), or piece of plate iron the figure (shape) of the drain, fixed to one end of it; by which means the drains may be cleaned without breaking up any part of the causewaying; but, if the drains are properly constructed, they will not require cleaning for several years. They should have a fall towards the tank of at least four inches to the ten feet, and be nine inches wide, six inches deep at the sides, and nine inches at the centre. By having this kind of triangular bottom, the smallest quantity makes a run (current) and forces every thing along with it. The drains through the straw-yard should have openings, with grates over them, situated in the lowest part of the straw-yard, to draw off the surplus water after falls of rain or snow. When these drains are not required, the grates may be

easily covered over with dung; and if, at any time, the dung is found too dry, movable spouts may be attached to the pump which is placed in the tank, by which means the liquid manure can be regularly spread over the whole straw-yard. A waste drain extends from the tank to an open ditch in front of the steading; by which means the liquid manure in the tank, if neglected, is carried off when it rises to that level, and is thus prevented from injuring the drains.

1142. *The Cattle-sheds*, from their situation, face the south, which is of great advantage to the cattle, though often overlooked in laying out farm buildings; and they are divided in the centre by a passage adjoining the turnip-shed, and opposite the straw-house. This passage rises like an inclined plane, 4 feet from A to B, the side walls or parapets being built up to that height, and forms a fence to both yards. All the dung from the feeding-byre and stable is wheeled into the straw-yards by this passage; which, from its central situation, admits of the stable dung being equally distributed through both yards, and this by the rising passage can be done without opening a door, which prevents the one class of cattle from intermingling with the other, or getting out. Straw-racks are placed in the sheds; but, by also having them in the centre of the yard, and connected with this passage, they can be conveniently filled, and the cattle are induced to divide, which mixes the dung more generally through the yards. The racks on the extremities of the passage are understood to be movable, and can be laid aside when carting out the dung. The piggeries, from their situation, may be conveniently supplied from the kitchen or boiling-house, and are in both yards. Pigs are very beneficial to the dung, from their turning it over and mixing it; they also eat up any particles of corn among the horses' dung that may not be digested. One small enclosure is provided in each yard, with a trough for feeding young pigs; thus protecting them from the cattle while eating: but they have no house or sty, which induces them to go out among the cattle, and to lie about the sheds. By this arrangement they have healthy exercise, enabling them at the same time to provide a part of their food, and be beneficial to the dung in both yards. Other two sties are provided for putting up two pair to feed. The gates to the straw-yard may either be of the common form, or be hung with stout ropes, pulleys, and weights. This last is perhaps the best plan, as it secures them from the risk of damage when the dung is being carted out of the yard, and they can be also raised as the straw in the yard rises.

1143. *The Cistern-house* is of such a height that pipes may be taken from it to the dwelling-house, boiling-house, calf-ward, &c. It may be either supplied from a fountain, if one can be found in the neighbourhood; or a well may be dug, and a pump placed within the cistern-house. A water-trough is placed in the division wall between the straw-yards; and a ball-cock is fixed in the centre of the said trough, and shut in by boarding, overlapped by the upper part of the wall, protecting it from injury from the cattle. The cock opens and increases running as the water falls low in the trough, and when the trough is full, the floating ball shuts the pipe. By this self-acting supply, the cattle at all times have the command of water, and none of it is wasted; if supplied from a fountain no attention is necessary, as the cistern will also shut itself in like manner, and the overflow, if any, will go off at the fountain head. Two troughs are placed on the outside for the horses, or the milch cows, and supplied with ball-cocks in the same manner.

1144. *The Roof Water*, in the inside of the court, is carried round with eave spouts, and with rain-water pipes at the south extremities leading it into drains. It is a material object to carry off the roof water without allowing its admixture with the manure in the courts.

1145. *The Dwelling-house consists* of the following apartments; viz. upon the ground floor two parlours, a bed-room, kitchen, servants' bed-closet, dairy, scullery or wash-house, with a small cellar, which may be got under the stair, and a coal-house. The upper floor consists of four bed-rooms and a servants' bed-room; but, in cases where more bed-rooms are required, an additional attic room could be got over the wash-house, having access from the same stair. The upper rooms go partly into the roof.

1146. *Estimate.—Mason's Work.*

	£	s.	d.
54 roods of rubble building, at 30*s.*	351	0	0
810 feet of rybats, soles, and lintels, at 1*s.*	40	10	0
302 feet superficial of hammer-dressed pillars in cart-sheds, at 4*d.*	5	4	0
60 feet lineal of cart-shed arches, hammer-dressed, at 1*s.* 6*d.*	4	10	0
98 feet lineal of cattle-shed ditto, at 2*s.*	9	16	0
52 feet lineal of squares droved, at 1*s.*	2	12	0
378 yards of causeway in stables and byres, at 1*s.*	18	18	0
476 feet superficial of flag division at cattle's head, at 8*d.*	15	17	4

1147. *Wright's and Slater's Work.*

1589 yards of wood roofing, at 5*s.* 3*d.*	417	10	0

51 roods 6 yards of slatework, at 75*s*.	190 : 0 : 0
723 feet superficial of lead ridges, piens, and flanks, at 1*s*.	36 : 8 : 0
149 yards of sleepers in flooring in low barn, at 5*s*. 6*d*.	40 : 19 : 6
511 yards of joisting in granaries and stable lofts, at 6*s*. 6*d*.	161 : 1 : 6
390 feet cubic for safe lintels (inside lintels) and beams, at 3*s*.	58 : 10 : 0
1523 feet lineal for skirting in granary and cow barn, at 4*d*.	8 : 14 : 4
140 feet superficial of weather-boards in ventilating the byres, at 6*d*.	3 : 10 : 0
108 yards of plain doors, with 3 bars each, at 3*s*. 6*d*.	18 : 18 : 0
192 feet superficial of luffer board windows, at 6*d*.	4 : 16 : 0
126 feet superficial in straw-yard gates, at 6*d*.	3 : 3 : 0
24 feet cubic in frames of hung gates, at 3*s*. 3*d*.	3 : 18 : 0
4 pulley chains and weights	2 : 5 : 0
36 feet cubic in beams at cattle heads, at 3*s*. 3*d*.	5 : 17 : 0
32 stakes for binding cattle, at 1*s*. 6*d*.	2 : 8 : 0
50 feet cubic of trevis posts, at 3*s*. 3*d*.	8 : 2 : 6
693 feet superficial of trevis boards, at 6*d*.	17 : 6 : 6
222 feet superficial of racks, at 4*d*.	3 : 14 : 0
185 feet superficial of mangers, at 6*d*.	4 : 12 : 6
36 pairs of crooks and bands for doors, at 5*d*.	9 : 0 : 0
3 pairs of cross-tailed hinges, at 2*s*. 6*d*.	0 : 7 : 6
22 stock locks, at 2*s*. 6*d*.	2 . 5 : 0
8 sliding bolts of a large size, at 2*s*. 6*d*.	1 : 0 : 0
9 ditto of a smaller size, at 2*s*.	0 : 18 : 0
45 feet superficial of three glazed windows, at 2*s*. 3*d*.	5 : 1 : 3
175 feet superficial of stair, at 6*d*.	4 : 7 : 6
46 yards of division walls in the poultry-house, piggery, and necessary, at 2*s*.	4 : 12 : 0
153 yards of plaster in granaries, at 5*d*.	3 : 3 : 4
46 feet cubic of anchor beams and posts in cart-shed at 3*s*.	6 : 18 : 0
	£1478 : 3 : 9

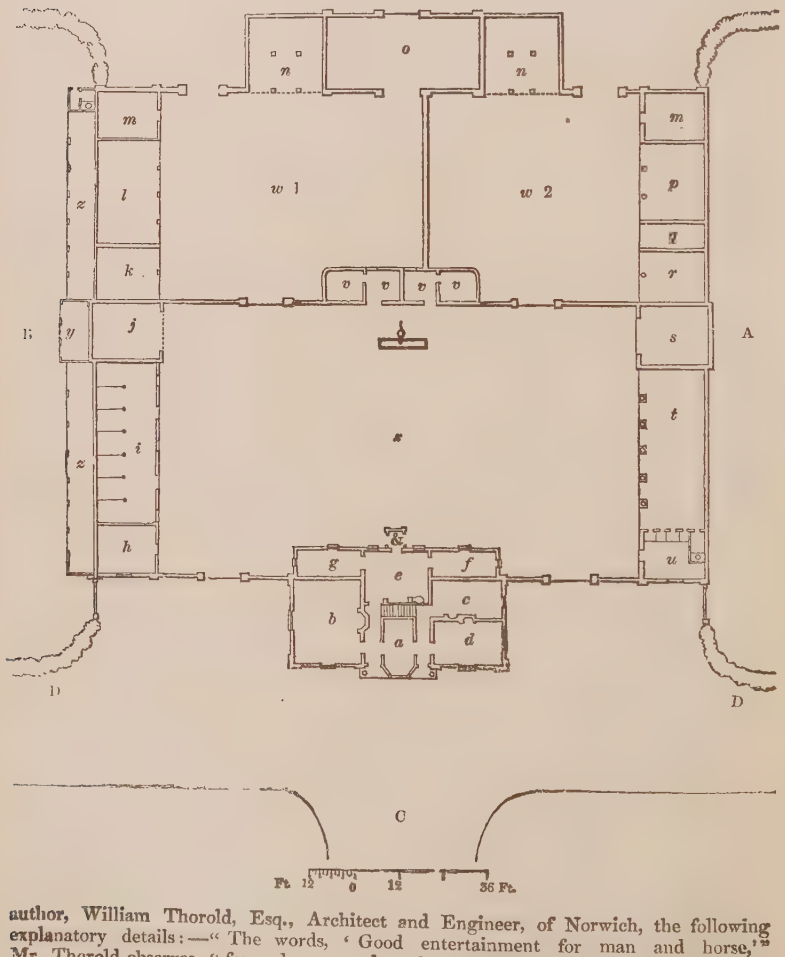
1148. *Remarks.* This Design was procured us by our much esteemed friend Mr. Gorrie, who informs us that it is built exactly on the model of one which obtained a premium for its author from the Highland Society of Scotland. "The farm of Elcho, where the above farmery stands," Mr. Gorrie remarks, "is partly clay and partly black land, and may be considered as a fair medium average of Carse of Gowrie farms, as to size, soil, and mode of cropping. Many of the best farms in the Carse of Gowrie contain a proportion of black land, which admits of turnips being raised for feeding. On Elcho, and such Carse farms, the whole is under tillage; clover, standing only one year in the course, admiting of little pasturage. On black lands, a pair of horses with a plough are equal to the labcur of 40 acres; 6 ploughs with 12 horses, and a few supernumerary, are equal to the working of 240 acres. On farms wholly clay, 8 ploughs are necessary for the same extent, under the same rotation of cropping; and, on such farms, feeding-byres and additional stabling would be requisite. In other respects the plan of Elcho farmery would be suitable, holding out many advantages. Several mills go by water near the northern banks of the Carse, and this element is available near the river Tay. Elcho is situated near the west end of the Carse of Gowrie, and on the south side of the Tay." To us this Design appears decidedly the most perfect of upwards of a hundred which have been sent us from different parts of the country, and from which we have chosen those given in the present section. Its excellence evidently depends on two things; first, on the Architect being a thinking and ingenious man, really intent on carrying improvement into every department of his profession; and, secondly, on his knowing thoroughly the uses of a farm yard. He is, or appears to us to be, among the builders of farmeries, what Mr. Fowler of London is among the builders of public markets, — an Architect of reason, and not a mere follower of precedents; a man, in short, anxious to do something more than leave his art exactly where he found it. No Architect can improve the arrangement of a building of which he does not thoroughly understand the use; for which reason, in all our Designs, we have endeavoured to show the uses of all their different parts; and we have also enlarged on this subject when treating of Fundamental Principles and Model Designs, in a manner which, in a work professedly devoted to Architecture, must, no doubt, have surprised many. This we have done, because we are convinced that the knowledge of the uses of any building constitutes the essential foundation of all architectural improvements in it, beyond that of mere design and taste; which, it must be remembered, are to an edifice only what dress is to a man, not the man himself. In perusing Mr. Mackenzie's description of his plan, we find in every sentence evidence of his intimate acquaintance

with the business of the farm yard; and we cannot help being delighted with the improvements which he has introduced. The circular feeding-house is a new and excellent idea, the whole arrangements of the barn and straw-house are admirable, and, as the author observes, must save a great deal of labour. The inclined plane, and its right and left level elevated branches, for wheeling the manure from the stables into the middle of the cattle courts, without the necessity of opening a gate, is excellent; as is the idea of the pump and general supply cistern being placed in a house, to protect them from the frost. In a country where flag-stone abounds, long, narrow, liquid manure tanks are, as shown, preferable to circular or square forms covered by arches, on account of their cheapness. On the whole, we strongly recommend the young Architect to make himself master of this Design in all its details; because there are several points in it which he may introduce in the very humblest of farmeries, and because most, or all, of them should be included in all extensive ones.

Design XXXVI.—*A Public House and Farmery; the Publican being, at the same time, a small Farmer and a Butcher.*

1149. *Accommodation.* The general appearance of this public house and farmery is shown in p. 536; the ground plan in fig. 1070; and we have received from the

1070



author, William Thorold, Esq., Architect and Engineer, of Norwich, the following explanatory details:—"The words, 'Good entertainment for man and horse,'" Mr. Thorold observes, "formerly appeared on the sign-board of every country alehouse;

and, in order that we should maintain the character of 'good,' it is necessary to make the accommodations and appearances correspond with modern refinement, which we have endeavoured to do in the present Design. In fig. 1070, to a scale of 48 feet to an inch, the bar, *a*, is represented with a bow window, overlooking the road, and is surrounded on the other sides by the entrance lobbies and staircase, being warmed from the back of the kitchen range. The dining or club room, *b*, is proposed to be occasionally used as a magistrates' petty sessions room; the two small parlours, *c* and *d*, have cellars under them, the kitchen, *e*, is approached from the yard, *x*, by a small porch; and this kitchen should have a cooking-range, copper, oven, &c., and must be used also as a back-kitchen; but the family washing can be done in the brewhouse, *s*. There is a dairy, *f*; pantry and store-room, *g*; and there are six sleeping-rooms on the first floor. There is a butcher's sale-shop, *h*; a lock-up stable, *i*; a coach and gig-house, *j*; a slaughter-house, *k*; and an open stable, *l*; with hay-houses, *m m*. Two open lodges are shown at *n n*, with stack staddles over their flat stone roofs. There is a barn, *o*, with a wicket at each end to pitch in the stacks. There is a cart-house stable at *p*; a loose box for a hackney, *q*; a cow-house, *r*; brewhouse, *s*; cart-lodge, *t*; place for fowls, fuel, and women's privy, *v*; a yard for driven cattle, *w* 1; a yard for farm cattle, *w* 2; and a paved yard, *x*, with pump and water-trough. The house and brewhouse are supposed to be supplied by underground pipes. There is an orchestra at *y*; and two verandas for playing at skittles, or for separate alcoves or pavilions for taking refreshments in, *z z*. There is a kitchen-garden, A; a bowling-green and tea-garden, B; a parish road, C; and a turnpike road, D.

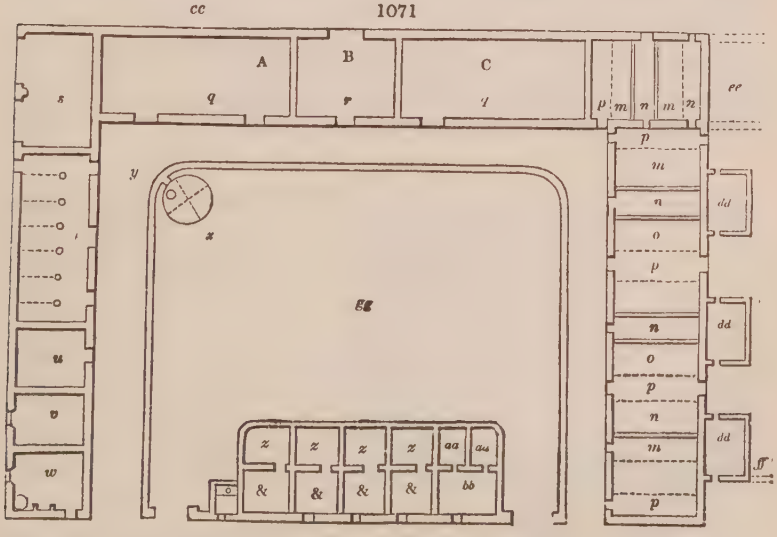
1150. *Construction.* The walls may be of rubblestone, bricks, or clay lumps; and the roofs covered with slate.

1151. *Remarks.* This Design is supposed to be in the plainest possible style; and it is intended to introduce drains, manure tanks, and every other economical arrangement, in its details." We consider this a very complete Design of its kind; its author is not only a scientific Architect and engineer of considerable practice, but he has also had much experience in farming, in the county of Norfolk.

Design XXXVII. — *A House and Out-buildings for a Cheese Dairy Farm of from* 300 *to* 350 *Acres, in Cheshire.*

1152. *Accommodation.* The ground plan of the house, which we have not given, contains a parlour, dining-room, kitchen, or, as it is called in Cheshire, a house-place

1071



staircase; pantry, with a cellar under; dairy, with cheese bench; situation for cheese-presses, and boilers, there are a milk-room, with a cheese-room over it; and a salting-house, also with a cheese-room over it. The farmery contains four cow-houses for six cows each, *m*; and two for twelve cows each, *o*; with foddering bays. *n*, and cleaning-passages, *p*, between. There are in the barns two corn-bays, *q*, and a threshing-bay, *r*, where the machinery would be placed if a threshing-machine were employed. There

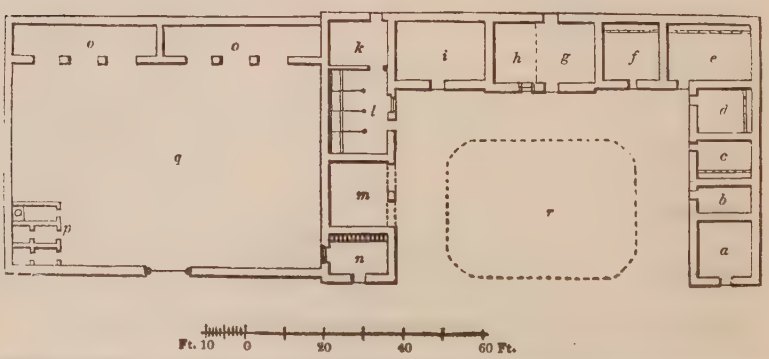
is a stable for six horses, *t*, an hospital for sick horses, *u*; a wheelwright's or carpenter's shop, *v*, with a store-room over it; a steaming-room, *w*; a reservoir for liquid manure, *x*, with a pump, *y*; four inner pig-cots, *z*, with outer pig-cots and two poultry-houses, *aa*, with a poultry-yard, *bb*. The stack-yard is in the situation, *cc*, and it contains sixty feet in length of hay-sheds, twenty feet wide, and twenty-two feet high, in one or more lengths, as may be most convenient. There are three calf-cots, *dd*, and sheds may be continued at *ee*, with a wall at *ff*, so as to form an additional straw or fold yard to that in the centre of the farmery marked *gg*.

1153. *Remarks.* — This Design has been made, at our request, by Alexander Ogilvie, Esq., of the Mere, near Knutsford, Cheshire. Mr. Ogilvie was a pupil of the late Dr. Coventry, and has since had extensive practice both as a land steward and as a farmer. We saw his crops and his dairy when we visited him at Mere, in July, 1830, and found them greatly superior to any in the neighbourhood. His dairy practice was also of an improved description; and, at our request, he has furnished us with plans and elevations of his improved cheese-press, which we shall give under the head of Farm House Furniture. The plan of the farmery was accompanied by the following observations: — "This plan is something near what I should think a house and set of offices *ought* to be on a farm of from 300 to 350 acres, in Cheshire: but I am sorry to say that the poor tenants of this district are obliged to put up with buildings of a very different description; partly owing to the landlords not liking to see a gentleman farmer in their neighbourhood, and partly owing to the class of men who, in this country, generally have the charge of landed property being incompetent to judge of the best system to be adopted for the ultimate and permanent benefit of the estate. There are several things of minor importance that have been omitted in this Design; such as a coal-yard, &c.; but these will not affect the general merits or demerits of the plan. If I occupied such a farm myself, with similar out-buildings, I should certainly have a threshing-machine, and that one to be moved by a steam-engine of about six-horse power, by which I could thresh my corn, cut my hay, straw, turnips, &c., and steam my potatoes and other articles. The machine would stand in the one corn-bay, on a loft or platform raised eight feet from the ground, with a winnowing-machine, &c., under it; then the threshing-bay, shown in the plan, would be the place where the straw would be deposited when thrown from the shaker of the machine, and the other corn-bay would become the straw-house. Behind the cow-houses there might be a straw-yard, if required, with sheds for young cattle and young horses during the winter months. This is shown by the dotted lines *ee* and *ff*."

Design XXXVIII. — *A Mixed Stock Farm, in a high (hilly) Country, employing only One Pair of Horses.*

1154. *Accommodation.* In the ground plan, fig. 1072, are shown a potato-house, *a*; spare-house, or place applicable for different purposes, *b*; house for young cattle, *c*; cow-house, *d*;

1072



larger cow-house, *e*; small cow-house, *f*; corn-barn, *g*; part of the barn to be floored and lofted, *h*; house for holding wool, to be floored with boards, *i*; hay-house, *k*; stable, *l*; cart-shed, *m*; poultry-house, *n*; two sheep-sheds, *o o*; two pigsties, *p*; sheep-yard, *q*; and yard for dung, *r*.

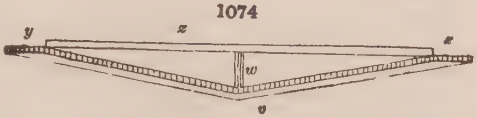
1155. *Construction.* The walls are of stone, and the roof is slated. The surface on which this farmery stands is supposed to have an inclination to one point, to which all

the rain water which falls on the roofs of the houses and on the yards, and all the liquid manure, are drained by open gutters, or underground conduits, formed in the manner shown in the section fig. 1073,

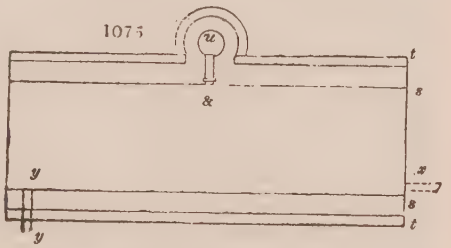
1073

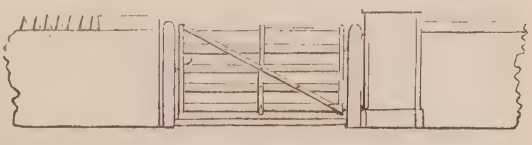
which are discharged into a tank, of which fig. 1075 is a ground plan, and fig. 1074, a longitudinal section. This tank is about forty-four feet long by twelve feet wide; the water may enter at one end, and there may be a waste gutter at the other, in case it should at any time be allowed to overflow. "The sediment is supposed to settle in the basin. The chaff, or other dry substances, that it is wished to convert into manure, and that are difficult to rot, may also be put in here; and it is intended that the width and slope of the basin should admit of carts passing through it for carrying off the sediment. On one side, fig. 1075, *u* is supposed to be sunk about four feet deep below the bottom of the basin, and the water to be drained thence through a close grating, *&*. A pump is proposed to be put into the well, and to stand sufficiently high above the ground to throw the water into a barrel on a cart, which may then be taken to the field, and discharged on the soil, in the same way as the streets are watered in towns. If the grating should not make the water sufficiently free from mud, a small bundle of wheat straw, well drawn, and loosely tied, put up against it, will be found to answer the purpose. A hatchway, or manhole, should be made in the cover of the well, in order to admit of a person going down occasionally to clear it out." (*Highland Soc. Trans.*, vol. viii. p. 388.) The soil in which this tank or basin is formed is supposed to be rocky or gravelly, in which case a layer of clay puddle should be placed underneath the causewayed bottom, and a vertical stratum of the same material should be put at the backs of the side walls; but in clay soils this will not be necessary. In fig. 1075, *s s* are the side walls; *t t*, vertical strata of clay puddle; *u*, the well; and *&*, the grating. In fig. 1074, *v* is the layer of clay puddle under the causeway; *w* is the grating before the opening to the well; *x*, the point at which the water enters; *y*, that at which it escapes; and *z*, the coping of the side walls. Fig. 1076 is a suitable plan for a gate for this description of farm yard. "The right side pillar is intended for a situation where freestone can be easily obtained; and the left side represents the finishing in a situation where inferior stone only is to be got, or where the expense of better finishing is not approved of; but, if it should be thought preferable, a round pillar may be formed of any kind of inferior stone. The gate-posts are supposed to be ten inches in diameter, circular, or in the octagon form, and sunk in the ground. As it frequently happens that gates into straw-yards are obstructed in their opening, when the courts are becoming filled with dung, it is proposed to hang this gate about nine or ten inches clear of the surface; and to make up the space between the surface and the gate by laying a piece of coarse wood below the gate, about six or eight inches in diameter, which can be taken out, so as not to obstruct the wheels of carts when the dung is removed from the court. A gate put together in this way is very substantial; and is easily repaired, when any part of it fails. As a means of preserving the gates in spring, when the cattle leave the yards, they should be all taken off, and put into the sheds, where they may remain till they are again required.

1074



1075





1156. *Remarks.* This Design, and those of the six following farmeries, have been taken from a collection published in the *Transactions of the Highland Society of Scotland*, vol. viii. These Designs were composed by Mr. Waddell of Berwickshire, an Architect of great experience in the laying out of farm buildings, under the superintendence of the committee of the society; and we are informed by our much esteemed friend, David Low, Esq., Professor of Agriculture in the University of Edinburgh, that he considers

them, though capable of improvement, yet the best which have hitherto been published In consequence of our having received this opinion from such high authority as that of Professor Low, we have deemed it our duty to make a selection, such as we consider will render our series complete. The Designs in the *Highland Society's Transactions* are prefaced by a general specification, and some accompanying remarks, from which we have made the following extracts and abridgments.

1157. *The Designs published by the Highland Society* are contrived solely with a view to utility, and to correct the prevailing errors in this description of buildings; viz., that of crowding them together, under the idea of giving them greater compactness; and that of not giving them a sufficient extent of shelter-sheds for the feeding of cattle. "The last is a fault so universal, that it is only on the larger class of breeding and feeding farms, in the border counties of England and Scotland, that experience has taught builders fully to avoid it." "In giving designs of the outhouses of a farm," it is judiciously observed, that "little more can be done than to present useful examples. Although a certain similarity must exist in the form and arrangement of the parts of all such buildings, yet these must be modified according to the circumstances of the farm itself, the nature of the soil, the situation with regard to markets, and the particular kind of management to be pursued. No one rule that can be given is of general application; and the judgment of the Architect must be shown in adapting the size, form, and arrangement of the buildings to the nature of the farm, and the wants of the occupier. While every suitable accommodation should be afforded to the tenant, it is the province of the Architect to take care that the heavy cost of such buildings be not unnecessarily enhanced, either by erecting buildings that are useless, or by giving unnecessary dimensions to such as are requisite. It may be particularly remarked, that the giving unnecessary breadth to the buildings adds materially to the expense, by increasing the dimensions of the timbers, and adding to the size of the roofs. At the same time, care must be taken that, in the cow-houses and stables, the animals shall not be cramped from the want of necessary room." (*Ibid.*, p. 368.)

1158. *The most convenient Arrangement of a Farmery* "is in the form of a rectangle, the side to the south being open; and the farm house being placed at some convenient distance in front of it. The most approved mode of keeping and feeding the larger and finer kinds of cattle is in small sheds, with open yards attached, each capable of holding two animals. In the Designs which follow, the sheds are of larger dimensions, but they can be subdivided where this mode of managing the feeding stock is adopted."

1159. *In arranging this, and the Eight following Designs,* "wherever uniformity and convenience could not be combined, the preference has been given to the latter; and nothing has been proposed but what has been found, from experience, to be useful and practicable. But it is quite impossible, especially in the largest class of farm buildings, to get all the apartments arranged so conveniently as could be wished, consistently with any degree of regularity; nor does it seem to be possible to lay down a plan that will suit the wish of all farmers, there being so great a diversity in the modes of occupation, kind of management, situation, soil, &c."

1160. *Drainage.* "It is recommended that the liquid manure from the stables, cow-houses, and yards should be carried off, by causewayed open channels, to a pond or tank near to the buildings. This mode of conveying away and receiving the urine and dung-water is conceived to be better in ordinary cases than conduits below ground, which, even when executed in the best manner, will be subject to be choked up from the want of necessary attention to cleaning: further, such sewers become nurseries for rats, notwithstanding every precaution that can be taken. Conduits may be made through the ranges of building, below the floors, at proper places, so as to discharge the liquid into a pond or tank exterior to the farmery."

1161. *Water.* "With respect to watering the cattle in the yards, no indication of the mode of doing so is given in the Designs, as this must depend on whether the water is got from a stream, or from a well. If a stream cannot be obtained, there are few situations where water cannot be got by sinking a well; and the best way is to raise the water into a cistern, which may be placed in any of the shelter-sheds or other houses, seven feet above the ground; or, if the water will not rise so high, a small apartment may be made for it, and from this it may be conveyed to cisterns with ball cocks, in the different yards and places where it is wanted; care being taken to lay the pipes so as that they may be easily emptied on the approach of frost."

1162. *The Shelter-sheds and Yards* "should always be open to the south; and the sheds, unless where they are very large, will be found to answer better with only one opening in front; as by this means they afford more warmth to the cattle. The usual objection to this is, that one ill-natured beast will keep out the rest: this, however, seldom happens. A farmer of much experience recently told Mr. Waddell that last year he built up all the openings, except one, in one of his sheds, and that he knew a great

difference in favour of the stock in that yard, as compared with those in which there were three or more openings in the sheds. The animals were finer in the skin, and, in other respects, in better condition."

1163. *Passages.* "It may appear, in several of these ground plans, that the passages and the entrances to the different apartments are wider than necessary; but it is a matter of great consequence to have open and free access, where a number of carts and cattle frequently come in contact."

1164. *Turnip-house.* "As it is necessary to lay up a stock of turnips as a supply when they cannot be got from the field either on account of frost or wet weather, a turnip-house is delineated in some of the plans; though it is to be observed that these turnip-houses are of no great utility, since it is found that turnips keep much longer when put together in a sheltered place in the open air, well covered with straw, than they will do in a close house."

1165. *Threshing-mills.* "No Design has been given either of a water-mill or steam-engine house for the threshing-machine; as the erection of these is subject to circumstances, and their size and position are naturally under the direction of the millwright."

1166. *Gates.* "In all the plans here designed, the gates are shown to be hung on wooden posts, which are not so easily knocked down by carts as common stone pillars. But this does not prevent the adoption of hewn-stone pillars, which both have a better appearance and are much stronger."

1167. *All the inside Gables* "are intended to be carried to the top."

1168. *With regard to ventilating the Stables and Cow-houses,* "it is recommended that openings of about six inches high, and the same width as between the rafters, shall be made in the roofs, and fitted up with boards, about three inches broad, suspended by pivots, and moved by a crank, in the same way as the luffer-boards in a granary window. One, two, or three of these, in a stable or cow-house, according to the length of the apartment, will, if attended to, be found to be of great service."

1169. *Boiling-houses and Stables.* "In all the boiling-houses the roofs should be lathed and plastered in the inside, round by the back of the cupple (couples, or rafters), and should have a large ventilator to let off the steam. The saddle-horse stables should be plastered in the same way."

1170. *In the Construction of these Buildings,* "the corners, ribbets (reveals), arches, and skews are supposed to be of hewn stone; the wood of Memel fir; the slates from Easdale; and the ridges of flanks (gutters in the valleys) covered with lead. The cost and workmanship of all the materials are included in the general estimate, except the prime cost of stones. In most of the plans, metal pillars are designed for the cart-sheds; but, where stones can be easily procured, it is recommended that they should be made use of, in preference to metal. The stones for the bases of the metal pillars should be one foot eight inches broad, and one foot two inches thick." (*Ibid.*, 372.)

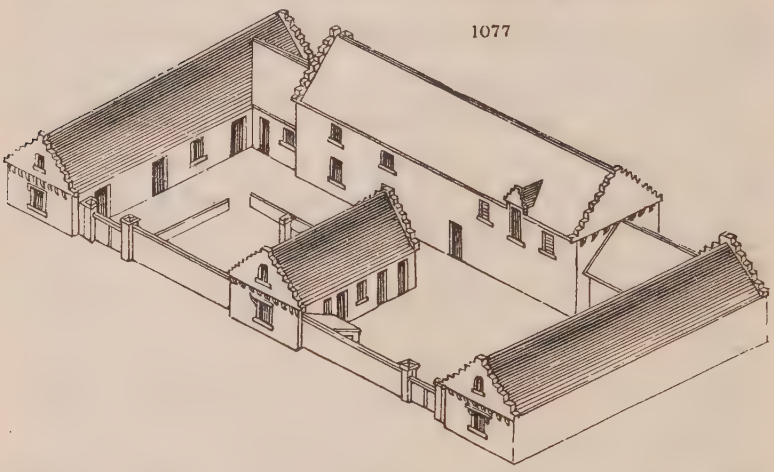
1171. *The Plan*, fig. 1072, "being intended for a hill farm, principally in pasture, it is supposed that only one pair of work-horses is employed; but the stable is made to hold four, because, on a farm of this sort, there should always be a third ready to be employed occasionally, frequently a breeding mare; and the fourth stall is required for a riding-pony. It is supposed that three or four cows are to be kept, and their calves brought up till they are two or three years old, which will consume all the fodder produced by this extent of arable culture. Should more horses be employed, or the farm produce much meadow hay, more cattle might be kept; and, consequently, the houses for cattle would then require to be enlarged. A room is designed for holding wool, which by some may be thought unnecessary, as the barn or cow-house is frequently made use of for holding it till sold; but it sometimes happens that, in bad markets, the wool is kept over the year; and in this case a house for it is necessary. There are also added shelter-sheds, and a yard for handling sheep, which may be subdivided by hurdles, as required. Shelter of this kind for ewes in lambing is of great service in bad weather. It is thought, on the whole, that in this Design there is as small an extent of building as should be erected on a considerable-sized farm of this description." (*Ibid.*, p. 387.)

1172. *General Estimate.* The probable expense of executing this plan, exclusive of the carriage of materials and prime cost of stones, will be about £410; and, if covered with tiles, £322.

Design XXXIX. — *A Farmery for a Garden Farm of* 200 *Acres, situated near a Town, employed wholly in Tillage, where no Stock is kept but Horses and Family Cows, and where the whole Produce is sold.*

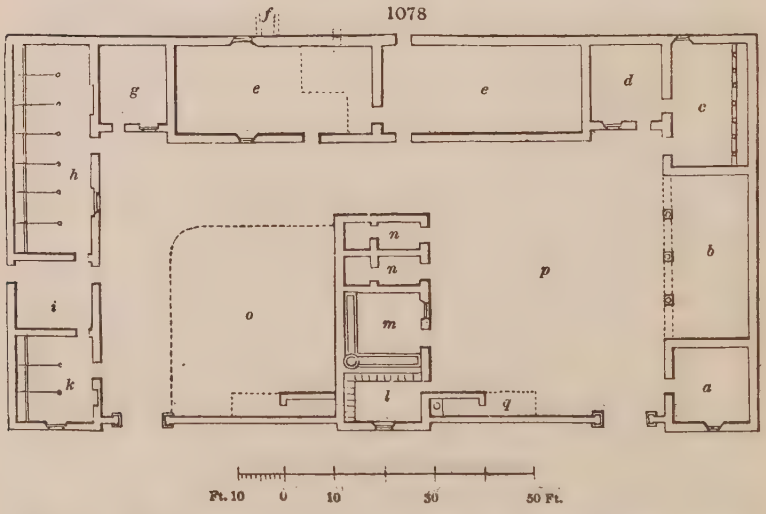
1173. *Accommodation.* The general appearance is shown in fig. 1077, and the ground plan in fig. 1078. The latter contains a potato-house, *a*; cart-shed, the pillars of which are of iron, with stone bases and caps, *b*; cow-house, *c*; calf-house, or place for a mare and

1077



foal, *d*; straw-barn and dressing-barn, *e*; situation of the granary, or outside inclined plane, up which the unthreshed corn is carried to the feeding-board of the threshing-machine, *f*; spare house, *g*; stable, *h*; hay-house, *i*; riding-horse stable, *k*; poultry-house,

1078



l; house for boiling or steaming food, *m*; two pigsties, *n*; dung-pit, *o*; and open court, *p*; privy, and place for a dog, *q*. One pump may be conveniently placed in the boiling-house, and the other in the hay-house.

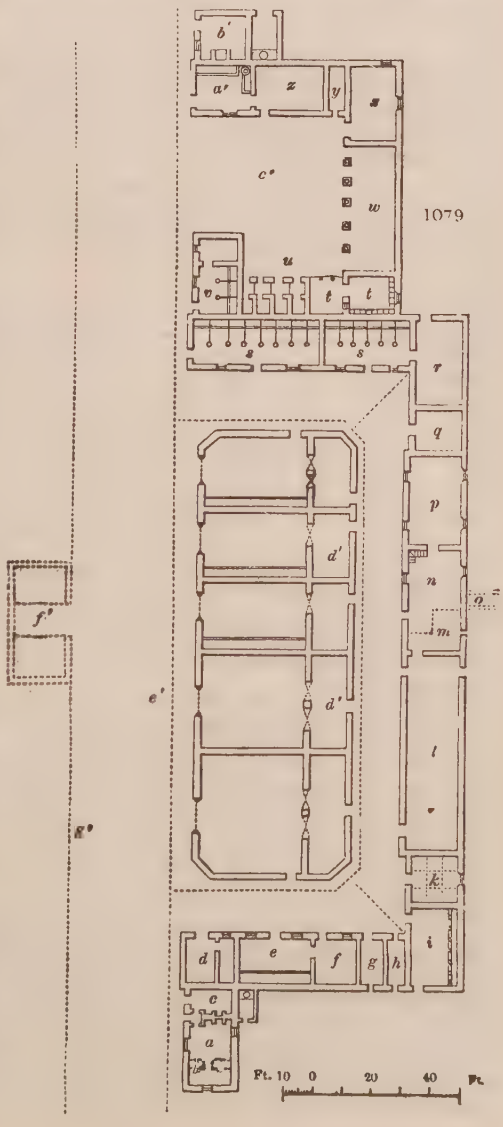
1174. *Remarks.* This farmery is supposed to be situated on the side of a public road, near a town. The doors on that account are placed on the inside of the court, with a wall in front eight feet high, that they may be locked at night; but in other situations this wall will be unnecessary. The accommodation here shown will be found sufficient for most situations. The dressing-barn might answer a few feet shorter than it is represented; and, if the straw-barn should be thought too short, the space thus gained could be thrown into it. It is proposed to make the straw-barn ten feet high to the joists, which would hold a sufficient quantity of straw, and give room for putting it up in bundles for the market, &c. The granary above this will be four feet six inches high from the floor to the top of the wall, which, with six inches of beam-filling, will give

five feet from the floor to the intersections of the cupples (rafters). If these offices were not on the side of a public road, it would be an improvement to make the boiling-house and poultry-house face the south.

1175. *General Estimate.* This Design, exclusive of the carriage of materials, and the prime cost of stones, will cost, in the south of Scotland, about £550; and, if covered with tiles instead of slates, the expense will not exceed £400. Dividing these sums by the number of cubic feet, we have, in the first case, $2\frac{1}{2}d.$ per foot, and, in the second, $1\frac{3}{4}d.$ per foot, which may be considered the guess prices for this description of buildings in Scotland.

Design XL. — *A Farmery for a Farm of 500 Acres, kept in a Rotation of Corn Crops and Pasture, producing Turnips, and employed partly in breeding, and partly in feeding Stock.*

1176. *Accommodation.* The ground plan, fig. 1079, shows an overseer's house, with a kitchen, *a*; two box-beds, *b b*, partitioning off a light closet, or bed-room: there is besides, a small parlour, *c*. Adjoining this are a gig-house and harness-room, *d*; cow-house, *e*; house for hay or turnips, *f*; mare and foal house, *g*; house for a bull, *h*; servants' cow-house, *i*; calf-house, *k*; straw-barn, *l*; threshing-machinery, *m*; dressing-barn, *n*; gangway, or inclined plane, from the rick-yard to the floor for unthreshed corn, *o*; under-granary, *p*, with a granary over; spare house, *q*; hay-house, *r*; stables, *s s*; poultry-house and yard, *t t*; pigsties, *u*; stable for riding horses, and saddle-room, *v v*; cart-shed, *w*; carpenter's shop, *x*; foal-house, *y*; potato-house, *z*; house for boiling and steaming food, *a'*; smithy, *b'*; open yard, in which no litter or manure is placed, *c'*; shelter-sheds, and fold-yards, with cribs in the latter, *d'*; paved gutter for collecting and conveying away the surface water, *e'*; place for storing turnips, *f'*; and supposed line of fence, *g'*.



1177. *Remarks.* This is a very complete plan, though we could wish some more accommodation to the overseer's house. The separation of those houses which require no litter into a square by themselves, *c'*, is very judicious. The poultry-house here, *t*, ought to have a communication with the stable, for the sake of heat. The pigsties we would remove, and add the space they stand on to the poultry-yard. Places for pigs might be formed in

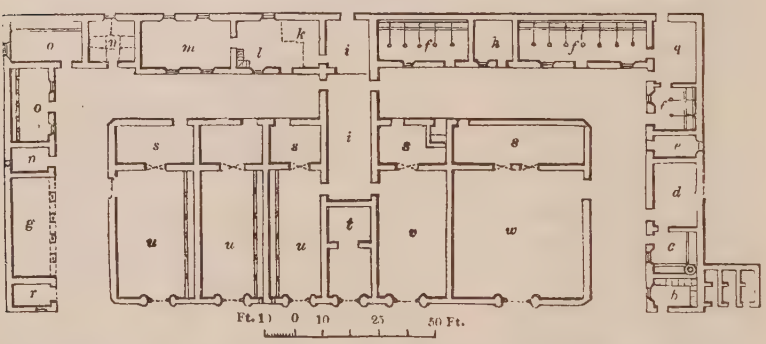
the central shelter-shed. The following observations on this plan are by the committee of the Highland Society: "The shelter-sheds are placed within the square; and, should they be thought too small for a farm producing a great quantity of straw, they may be enlarged by throwing them a few feet forward. There are also designed an overseer's house, and a smithy and carpenter's shop. Should these not be required, the cart-sheds could be placed where the overseer's house is; the boiling and potato houses at the west end of the riding-horse stable, and the west wing done away with altogether. A poultry-house could be taken off the straw-barn. By these means a considerable expense would be saved. The lower and upper granary would still make an extent of seventy feet by eighteen feet, which would be a suitable size for such a farm." (*Trans. High. Soc.*, vol viii. p. 382.)

1178. *General Estimate.* To execute this plan, exclusive of the overseer's house, smithy, and carpenter's shop, and of the carriage of materials, and the prime cost of stones, will cost about £1300 covered with slates; if covered with tiles, it will cost about £1020.

Design XLI. — *A Farmery for a Farm of 500 Acres of arable Turnip Land, kept under alternate Corn and Pasture, and employed in breeding and in feeding Stock, as well as in sending Corn to Market.*

1179. *Accommodation.* The ground plan, fig. 1080, shows pigsties, *a*; a poultry-house, *b*; house for boiling or steaming food, *c*; potato-house, *d*; foal-house, *e*; stables

1080



for seventeen horses, *f*; hay-house, *g*; spare house, *h*; straw-houses, *i i*; threshing-machinery, *k*; dressing-barn, *l*, with loft for unthreshed corn, &c., over it; lower granary, *m*, with another granary of the same size over it; calf-house, *n*; cow-houses, *o o*; house for bull, *p*; cart-shed, *q*; gig-house, *r*; shelter-sheds, *s*; shed for young horses or cattle, *t*, with a yard in front; feeding-yards, *u*; yard for young cattle, *v*; and yard for store cattle, *w*.

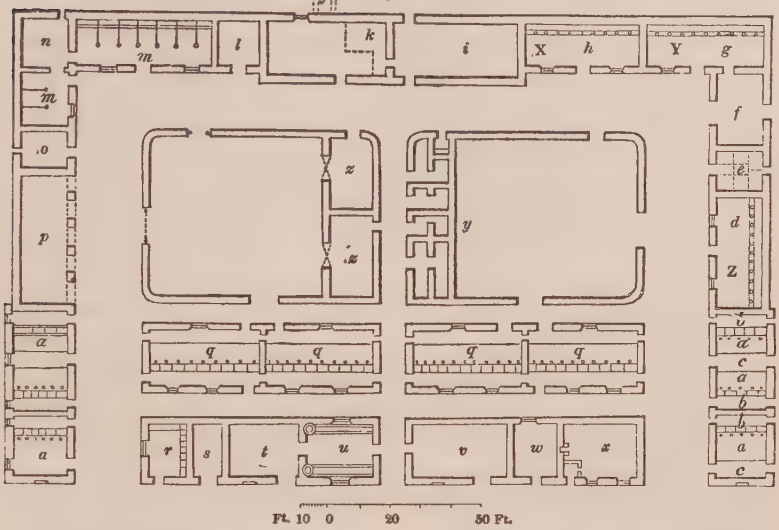
1180. *Remarks.* The committee observe that this plan will be found extremely convenient, though it does not contain near so much accommodation as the preceding one. The small yard, *t*, in the middle will be found to be very useful for different purposes. On some farms the length of the straw-barn would be quite sufficient, were it to terminate in a line with the front of the shelter-sheds. The cart-sheds would be better arranged if they opened to the exterior of the yard, as the cows going out and in are apt to be rambling among the carts, and injuring themselves.

1181. *General Estimate.* Exclusive of carriages, and prime cost of stone, this farmery will cost about £1190, covered with slates; and, if covered with tiles, about £940.

Design XLII.—*A Dairy Farm of 500 Acres, kept in a Rotation of Corn Crops and Grass one half being supposed to be in Hay or Pasture.*

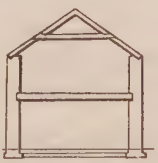
1182. *Accommodation.* The ground plan, fig. 1081, shows four cow-houses, *a*, with feeding-passages, *b*, and cleaning-passages, *c*; another cow-house, *d*; a calf-house, *e*; turnip-house, *f*; cow-house, *g*; another cow-house, *h*; straw-house, *i*; situation of the inclined plane from the rick-yard to the unthreshed corn-floor, *j*; and machinery, *k*; There are a spare house, *l*; two stables, *m*; hay-house, *n*; place for a bull, *o*; cart-shed, *p*; four cow-houses, *q*, each with a feeding-passage on one side, and a cleaning-passage on the other; a poultry-house, *r*; gig-house, *s*; potato-house, *t*; boiling-house, *u*; turnip-house, *v*; store-house, *w*; superintendant's house, *x*; pigsties, *y*; and shelter-sheds, *z*.

1081



1183. *Construction.* Fig. 1082 is a section across the dressing-barn, by which the space between the dressing-floor and the ceiling of the unthreshed corn floor appears to be eight feet. Fig. 1083 is a section across the straw-barn, with granary over; showing the height from the floor to the ceiling of the straw-room to be ten feet. Fig. 1084 shows two sections across the boiling-house and cow-house, exhibiting the cooling or scalding troughs of the boiling-house, *a a*; the feeding-passage of the cow-house, *b*; and the situation of the cleaning-passage behind the cows, *c*. Fig. 1085 is a plan of the corn-loft, or floor for unthreshed corn, of the barn; in which is shown the entrance for bringing in the sheaves by an inclined plane from the rick-yard, *d*; the opening for the

1082



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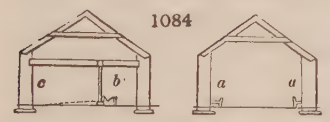

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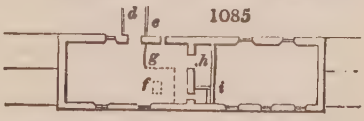


admission of the horizontal shaft, connecting the outside gin-wheel with the inside spur-wheel of the threshing-machine, *e*; the hatchway or trapdoor for descending to the dressing-floor of the barn, *f*; the situation of the machinery, *g*; the opening by which the straw is dropped by the shaker to the straw-house, *h*; and steps from the corn-loft to the granary, *i*.

1184. *Remarks.* "This plan is designed for a dairy-farm, and it is considered that a great proportion of the cows are fed on boiled or steamed food. There are two boilers, one being intended for steaming, and the other for boiling in the common way. The stalls, except those in the cow-houses marked X, Y, Z, are designed for the cows fed on boiled or steamed food, and may be fitted up with troughs of flat stones. On the supposition that a part of the cows are not giving milk, some of the cow-houses are designed with stalls in the common way, that the cows may be fed with straw, hay, or turnips. These cow-houses are marked X, Y, Z. In farm offices of this kind, a turnip-shed may be necessary, in order that a supply of turnips may be obtained, free from frost, in winter. Those cow-houses intended for the cows feeding on boiled or steamed food are all placed as near as possible to the boiling and store houses, with large open passages for conveying the food to the different places. The dung-pits are also constructed as near the cow-houses as possible. The walls round these pits need not be higher than three feet. A

shelter-shed is designed on the west side, for a few young cattle. If this should be required, the wall around it should be six feet high. On a farm of this kind, a considerable number of pigs may be kept; a number of sheds for them are therefore laid out in a convenient situation, and more can be added if necessary. A good supply of water to a steading of this description is of great importance; and the cistern may be put up over the gig or store house. A superintendent's house is also designed, it being necessary that such a person should be near the establishment at all times. It will also be proper to attend particularly to the architectural arrangements for cleaning and ventilating the cow-houses. In some farm buildings of this description, the dairy is connected with the outhouses; and the same power that drives the threshing-machine gives motion to the churn: but it is conceived that it would be more convenient to attach the dairy to the farm house at a little distance from the outhouses, where there would be purer air, and where the work is to be performed under the eye of the mistress of the farm. As the dairy does not, in the present Design, form a part of the houses, no plan of it is given."

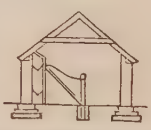
1185. *General Estimate.* This plan, exclusive of the carriage of materials and the prime cost of stones, will cost about £1300, covered with slate; if covered with tiles, about £1000. (*Ibid.*, p. 386.)

Design XLIII. — *A Farmery for a Clay-Land arable Farm of 500 Acres, not producing Turnips, and kept chiefly, or wholly, in Tillage.*

1186. *Accommodation.* The ground plan, fig. 1088, shows a cart-shed, *a*; tool-house, *b*; gig-house, *c*; stable, *d*; harness-room, with a flue for a stove, *e*; three stables, *f*; hay-house, *g*; spare house, *h*; straw-barn, *i*; dressing-barn, *k*, in which are indicated the place for the machinery, and the stair to the corn-loft; granary, *l*; two cow-houses, *m*; house for bull, *n*; calf-house, *o*; potato-house, *p*; boiling-house, *q*; poultry-house, *r*; two pigsties, *s*; shelter-sheds, *t*; yard for young cattle, *u*; yards for feeding cattle, *v v*; situation of the gangway, or inclined plane to the corn-floor, *w*; and rick-yard, *x*.

1086

1087



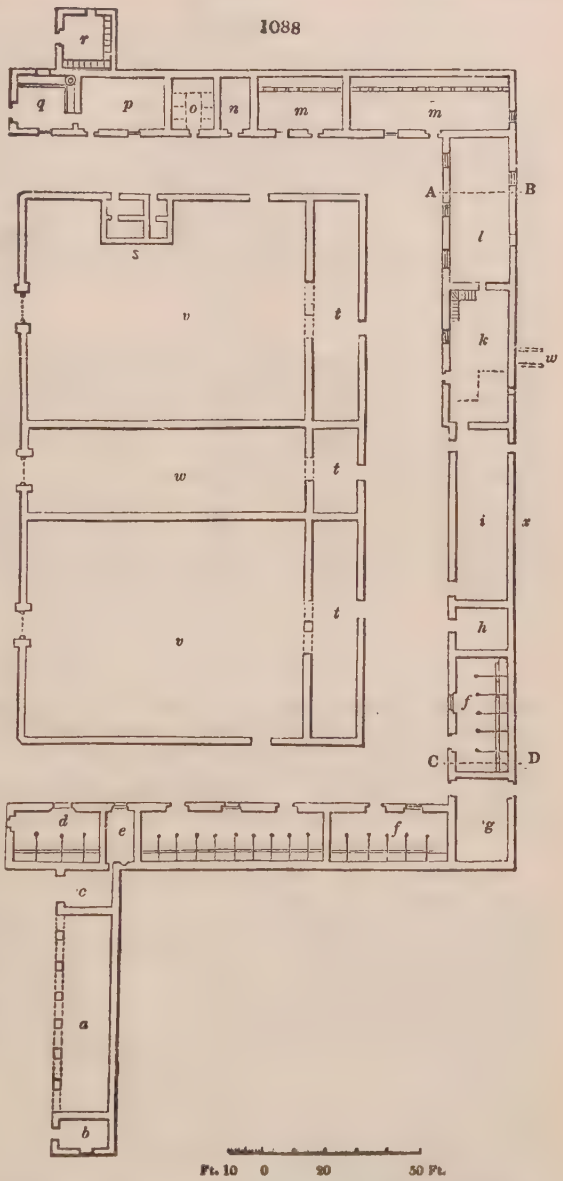
1187. *Construction.* Fig. 1086 is a section, A B, across the barn, or granary. Fig. 1087 is a section, C D, across the stable. With the exception of the barn and granary, all the out-buildings are only one story high; the walls of the straw-house are 10 feet high, and those of all the others 8 feet.

1188. *Remarks.* "In this plan, the stables and cart-sheds are conveniently situated, and the barns are well placed for supplying the courts or yards with straw. The dung from the stables and cow-houses is designed to go into the yards by the small gates. The yards here may be differently divided, if it be thought expedient. The extent of granaries above and below, together, is 88 feet by 18; perhaps more than in some, but not more than in other cases, might be required. The boiling-house, in this plan, is not so near the stables as could be wished; but, as there is not room for it and the potato-house in the same range where the stables are, and it being necessary to keep it near the outside of the square, and as far from the barn yard as possible, there is no other part where it could be so properly placed, except it were placed where the cart-sheds are, and the cart-sheds were made in the west range, which would be found to be attended with inconvenience. The flue of the boiling-house here may go round the back of the poultry-house, and the chimney be erected on the west side of it. There is also a plan for a small stove in the harness-room, next the saddle-horse stable, which will be found to be of great use in winter or damp weather." (*Trans. High. Soc.*, vol. viii. p. 384.) We have not, either in this case, or in most of the others, copied the elevations given by the Highland Society; because they are all of the very plainest description, and without the slightest pretension to architectural style. We must say, we deeply regret this circumstance; because a public body, so influential as the Highland Society of Scotland, might easily effect important improvements, not only in the economical arrangements, but also in the architectural taste, of farm houses, farm buildings, and cottage dwellings. Indeed, the farm buildings, and especially the farm houses, of the northern half of the island, are as far behind those of the south in point of architectural taste, as they are before them in point of arrangement. Where, for example, shall we find, in Scotland, a farm bailiff's house like that at Bury Hill, § 847; or, in the south of England, a farm-yard like that of Elcho? It is true that a mere farmery affords but slight opportunities of displaying architectural style; but, slight as these are, they are such as would render the most common-place arrangement of walls and roofs as different from the external appearance which they now present, as a wall of mud is from one of hewn stone.

Besides, there are always the gable ends: and every farmery must have one of three things highly susceptible of architectural style; viz. a shed to the gin-wheel of a threshing-machine; a water-wheel; or a chimney to a steam-engine. Most farmeries have a boiling-house; and many have a ploughman's lodge; both of which give rise to chimney-tops, which may always be rendered sources of conferring style. Neither should it be forgotten that there are such things as ventilators in the ridges of the roofs, respecting which the same remark may be made. As to the farm house, and the cottages of the married labourers which are commonly to be found adjoining the farmery; it is clear that, if the landlord wishes it, they can be rendered as beautiful as any other dwellings. But the grand feature of the modern farmery, on a large scale, is the chimney to the steam-engine; and to its form we would particularly direct the attention of Architects, and their employers; and, also, that of the Highland Society, which among its other committees, ought to have one of taste.

1189. *General Estimate.* "This plan, exclusive of the carriage of materials and the prime cost of stones, will cost, if covered with slates, about £1260; and, if covered with tiles, about £1020." (*Ibid.*)

1088

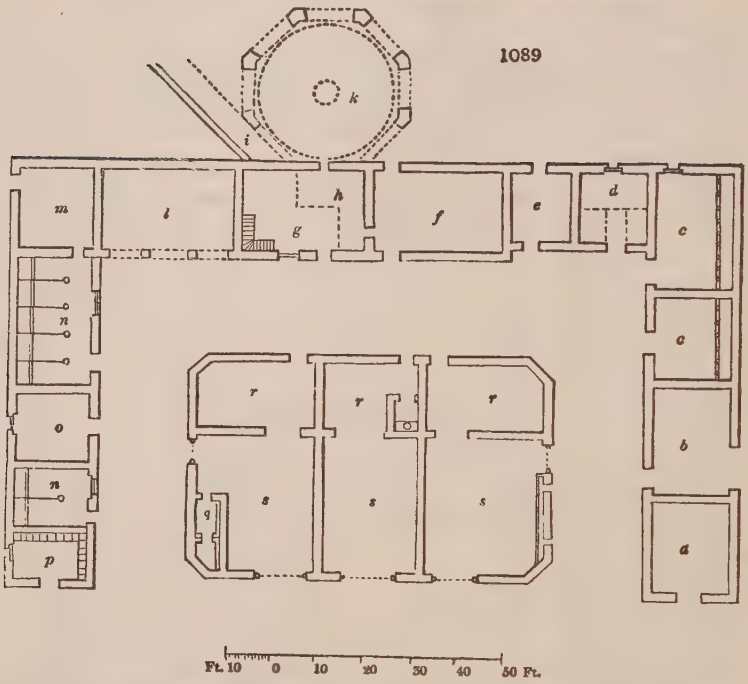


Design XLIV. — *A Farmery for a Farm of 150 Acres, kept in a Rotation of Crops and Pasture, producing Turnips and Potatoes; and employed partly in feeding and partly in breeding Stock.*

1190. *Accommodation.* The ground plan, fig. 1089, shows a potato-house, *a*; house for storing turnips, *b*; two cow-houses, *c*; calf-house, *d*; house for mare and foal, *e*; straw-barn, *f*; dressing-barn, *g*; machinery, *h*; gangway, or inclined plane to the corn-loft, *i*; horse-course, 30 feet in diameter, and covered with a conical roof, *k*; cart-shed, *l*; hay-house, *m*; stables, *n n*; spare house, *o*; poultry-house, *p*; pigsty, *q*; shelter-sheds, *r*; and yards, *s*.

1191. *Remarks.* "This plan will afford all the accommodation that could be wished

1089



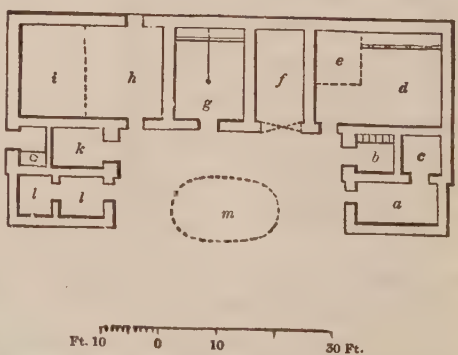
for in a farm of this size. The form of a horse-course is here added; for, unless sufficient water can be easily procured for turning a wheel, a farm of this extent will not afford the expense of steam or a wind power, and horses must be employed. The stables, containing but 4 horses, will answer very well at 15 feet wide."

1192. *General Estimate.* "This plan, exclusive of the expense of carriage and prime cost of stones, will cost about £600; if covered with tiles, about £476." (*Ibid.* p. 383.)

Design XLV. — *A Farmery for a Cottage Farm of 25 Acres.*

1193. *Accommodation.* The general appearance is shown in fig. 1091, and the ground plan in fig. 1090. The latter exhibits a court for calves, *a*; poultry-house, *b*, open to the cow-house, in order to partake of its heat; calf-house, *c*; cow-house, *d*; calf-crib, *e*; cart-shed, *f*; stable, *g*; barn, *h*; part of the barn to be lofted over, *i*; potato-house, *k*; pigsty and yard, *l*; and dung-pit, *m*.

1090

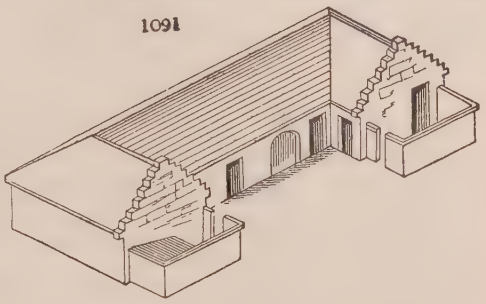


1194. *Remarks.* "This Design for a cottage-farm is plain and simple, and calculated for a country situation where ornament is not required. It is proposed to joist and floor a small part of the barn, laying the joists about 1 foot below the top of the walls. This will be found very useful, by admitting a draught of air near the bottom of the roof, for drying wet corn, grass seeds, &c." It would be easy to render this Design ornamental, by giving the openings the character of the old English style; but we can hardly think it in good taste to bestow much ornament on this class of buildings, which may be truly said to be, "when unadorned, adorned the most." With a comfortable cottage and garden

in front, which, however may, and indeed ought to be, ornamented, and with an orchard and rick-yard behind, what object can harmonise better with the sentiments called forth by the appearance of a simple tract of cultivated country?

1195. *General Estimate.* To execute this plan, we are informed, will require, exclusive of the carriage of materials and the prime cost of stones, about £164, covered with slates; if covered with tiles, about £130.

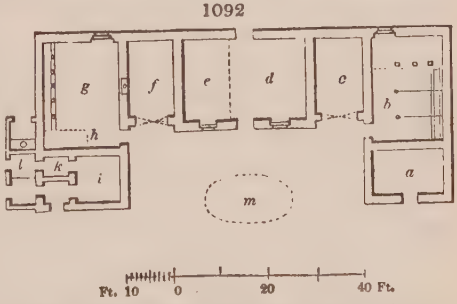
1091



Design XLVI.—*A Farmery for a Cottage Farm of* 30 *Acres, with Remarks showing how it may be extended so as to serve for a Farm of* 50, 80, *or* 100 *Acres.*

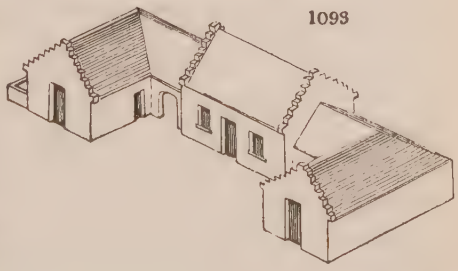
1196. *Accommodation.* The general appearance is shown in fig. 1093, and the ground plan in fig. 1092. In the latter is seen a potato-house, *a*; stable, with a bay at one end for hay, *b*; cart-shed, *c*; barn, *d*; part of the barn to be lofted at the height, of ten feet from the ground, *e*; house for turnips with a pump, *f*; cow-house, *g*; calf-crib, *h*; poultry-house, *i*; pigsties, *k*, with yards, *l*; and dung-pit, with liquid manure tank under, *m*.

1092



1197. *Remarks.* This plan resembles the preceding one, but the different apartments are somewhat larger. The same arrangement, with a small additional increase, will serve for a farm of fifty acres, and double the extent of barn and stable room, with the same accommodation in every other respect, might serve for a farm of eighty or a hundred acres, under a course of alternate grass and corn. In this case the turnip-house, *f*, would serve as a second cart-shed, and there might be a lean-to formed by the farmer himself, placed against the stable and potato-house wall, as a shelter-shed for cattle, and there might be a fold-yard in front of it, formed of bush faggots in Mr. Taylor's manner, § 1038

1093



1198. *Estimate.* This plan, exclusive of the carriage of materials, and prime cost of stones, will cost about £190, covered with slates; covered with tiles, it will cost about £150.

1199. *General Estimate applicable to the Nine preceding Designs.* On calculating the cubic contents, and on comparing these with the actual estimates, it appears that the average price per cubic foot, exclusive of the carriage of materials and the prime cost of stones, is, when the buildings are covered with slates, $2\frac{1}{2}d$, and when they are covered with tiles, 2*d*.

1200. *General Outlines of a Specification to the Nine preceding Designs.* — *Digging.* The trenches for the foundations to be 2 feet below the surface of the floors, or more, if necessary, to obtain a good solid foundation.

1201. *Mason's Work.* The foundations to be laid with flat-bedded stones laid in regular courses, breaking joint alternately, and to be taken in by regular scarcements, as shown in the sections. The whole area of the dressing-barn and low granary floors to be laid

over with small broken stones, forming the thickness of 9 inches. The sleepers to be laid on the inside scarcements, and the whole remaining space of 14 inches to be filled up with solid mason-work of stone and lime properly packed; to have a coat of plaster three fourths of an inch thick on the top, the surface of the plaster being kept one fourth of an inch below the top of the sleepers; care to be taken that the sleepers are resting on flat stones, at short distances; the lime which is applied next the walls all round, to be mixed up with a portion of broken glass. This, if carefully done, will keep the barn-floor clear of vermin, and also prevent it from sinking, as frequently happens. This under-building to be properly dry before the boards are laid on the top. The straw-barn to be done in the same way, with this difference, that the rubble-building above the small stones is to be only 12 inches deep, and to have a composition floor laid above of 3 inches thick, 9 feet broad, and, where the straw falls from the rakes, to be laid with large flags. The foundations of the low buildings to be 2 feet 9 inches at the bottom, and taken in by regular scarcements.

1202. *Door-Soles.* The door-soles of the barns to be laid 6 inches above the surface of the causeway, on the outside; those of the stables, cow-houses, &c., to be laid 3 inches above it, and beveled on the front.

1203. *Walls.* The thickness of barn-walls above the door-sole to be 2 feet 3 inches; above the second floor to be 2 feet, and beam-filled at the top. The thickness of the walls for the low buildings above the door-sole to be 2 feet, and likewise beam-filled at the top. The division walls to be 1 foot 6 inches thick, and carried to the top. The foundation of the walls of the courts or yards to be at least 1 foot below the general surface, founded 2 feet 3 inches at the bottom.

1204. *Hewn Work.* All the external corners in the houses and gate-pillars to be droved, with broached tails. The ribbets (rybets, rebates, or reveals), soles, and lintels of doors and windows to be droved with broached tails; all the ribbets and corners to be at least 2 feet long, the inband ribbets to pass through the thickness of the wall. The ribbet heads (outside facings or architraves) for barn windows to be 9 inches; the skews to be droved. The shed-pillars, arches, and chimney-tops to be of broached ashlar. The shed and gate pillars to be champhered (chamfered) or rounded on the corners 3 inches. The yard walls to be coped with flat, hammer-dressed, or Galloway cope (large irregular stones, projecting on both sides of the wall), as stones can be procured. The cooling-troughs, and the feeding-boxes for the cows on the dairy-farm, to be constructed with pavement.

1205. *Conduits.* If the water be carried away by under-drains or conduits, the great common sewer, or discharging conduit, to begin in a central part of the offices, to be 2 feet 3 inches wide, and 3 feet 6 inches high, so as to allow a person to go up to clean it. It may be arched or covered, as shall be most convenient; and the size of the side conduits to be according to the distance from the common sewer, namely, from 1 foot to 1 foot 6 inches wide, and from 1 foot 6 inches to 2 feet high, with chisel-jointed angle bottom, according to the sketch fig. 1073.

1206. *Causewaying.* The whole of the stables, cow-houses, calf-houses, pig-houses, &c., to be laid with whinstone causeway set in sharp sand. The settles (gutters) for carrying off the urine to have 1 inch and a half fall to 10 feet, or 2 inches to 10 feet, if the situation admits, or all the fall which can be had. The run channels (gutters) for stables to be 10 feet from the wall, and the rise from the channel to the rack to be 5 inches. The channels for cow-houses to be 9 feet from the wall; the rise from the channel to the sole-tree (the sill into which the posts to which the cows are tied are mortised) to be 4 inches. The area round the yard to be causewayed, and to have proper channels, with 2 in. declivity to the 10 feet, so as to carry the water to the settling-pits (liquid manure tanks). In situations where the extent of causewaying in the areas round the offices is considerable, by making the causewayed channels 4 feet broad, that is, 2 feet on each side of the run, the space between that and the buildings will answer nearly as well to be made up with small broken stones 9 inches deep, and blinded (the interstices filled up) on the top with small clean water sand. This, in a short time, will become a smooth hard substance, and will be obtained at less expense; or, if conduits are adopted, gratings must be made at proper places to communicate with the conduit: the gratings should be strong, and have the ribs well bent upwards, as in that form they are not so liable to be choked up.

1207. *Carpenter's Work. — Roofing.* The cupple (couple or rafter) sides for the houses of 15 or 16 feet wide, to be 6 inches and a half at bottom, 5 inches and a half at top, and 2 inches and a half thick, with a balk (baulk or tie-beam) 6 inches by 2 inches and a half, fixed as near the middle of each cupple as possible with double garron-nails, and properly riveted. The cupple sides for houses 18 feet wide to be 7 inches at bottom, 6 inches at top, with a balk or scantling to each, 6 inches and a half by 2 inches and a half, fixed as above. The cupples to be set at 20 inches from centres, on a wall-

plate 7 inches by 1 inch and a half, the sarking to be three fourths of an inch thick, well seasoned, and jointed closely. The sarking on the granaries to be half checked on the joints. Ridge-bottoms to be 2 inches by 1 inch and a quarter, fixed to the roof with iron spikes 3 feet apart.

1208. *Joisting and Flooring.* The sleepers in the dressing-barn and the low granary floors to be 6 inches by 2 inches and a half, built as described in the mason-work. The joisting in the loft for unthreshed corn and granaries to be 10 inches deep by 2 inches and a half thick, with 1 foot of wall-hold. Joisting and sleepers laid at 20 inches from centres, all covered with Dram timber battens (battens from Drammen, a sea-port in Norway, supposed to be of spruce fir); under floors to be plain-jointed, and doweled with iron dowels; the upper floors to be tongued and feathered on the joints, and fixed down with good flooring sprigs. The cart-sheds to have a joist built into the wall at each pillar, 8 inches by 2 inches and a half, and the wall-plate nailed down on the top of it. Those that have metal pillars should have linteling-beams 9 inches by 12 inches broad and the end of the joist tenanted 2 inches into the lintel to have an iron strap, split on the end, and put on the top with screw bolts, to fix the joist and the lintel together; the joist going through the back-wall; and the under side to be checked into a piece of wood 3 feet long, 2 inches and a half thick, and about 6 inches broad, built into the middle of the wall; also the wall-plate nailed on the top: this will keep the pillars firm in their position.

1209. *Safe-Lintels.* The whole of the safe-lintels (inside lintels) to have a wall-hold of 1 foot, to be 1 inch thick for each foot of the openings they cover, and from 9 inches to 12 inches broad; the whole breadth filled in like manner behind, and arched above where there is room.

1210. *Doors.* The whole of the doors to be made of deal not more than 6 inches and a half broad, 1 inch and a quarter thick, beaded on the edges, and grooved and tongued on the joints; with three cross bars to each, 9 inches broad, 1 inch and a quarter thick, and well nailed. The stable, cow-house, and barn-doors to be 3 feet 6 inches wide, and hung in two leaves where necessary, which is the case in some of the stables. The straw-barn and granary doors to be 4 feet wide, the whole of the doors to be hung on crooks with bands, the crooks to be laid on the bed of the ribbet. The crook to be split in the tail, to have 7 inches hold of the stone; the pin of the crook to be 1 inch and an eighth in diameter, each crook 3 pounds and a quarter in weight, well batted in with lead; and for 4-feet wide doors the crooks to be 4 pounds each, and the pin to be 1 inch and a quarter in diameter. The bands for 3 feet 6 inches doors to be three eighths of an inch thick at the neck, and 2 inches broad, 22 inches long, having a proper taper, both in breadth and thickness, from the neck to the tail, and to have a $\frac{3}{8}$-inch screw bolt to the neck of each, the weight of each to be 4 pounds and a half. Those for 4-feet doors to be 23 inches long, half an inch thick by 2 inches and a half broad at the neck, with a bolt as above, and to be 5 pounds and a quarter weight each. The band-nails to be counter-sunk, and properly riveted. The latches for the doors to be of the kind which has a sunk ring, but stronger made than in general. Locks to be selected according to the use of the different places where they are applied.

1211. *Windows.* The frames of the lower windows of barns, stables, cow-house, &c., to be made 2 inches thick, with boards below 16 or 18 inches high, hung on the frames with cross-tailed bands, and glazed above with second crown-glass; those in the granaries, and other places where glass is unnecessary, to be filled with weather-boards 6 inches broad, 1 inch thick, champhered on the outer edges, hung with iron pivots, in a frame 3 inches by 2, having a strap of iron attached to the inside, and moved up or down to admit air into the places when required. All the lower windows of the barn to be secured by iron bars 1 inch square, and not more than 5 inches apart, batted into the sole and lintel, and to have a cross bar in the middle, and the upright bars passing through it. The dressing-barn and granaries to have skirting-boards, 8 inches broad by 1 inch thick, nailed on bond timber built in the walls.

1212. *Trevises, Racks, and Mangers.* The hind-posts of the trevises to be 8 feet 6 inches long, 6 inches and a half square, made in the octagon form above the level of the pavement; to be sunk 3 feet and a half below the level of the pavement, and to be solidly built round, 3 feet in diameter, with stone and lime mortar; the parts of the posts to be properly charred on the ends, as far as they go below the ground, their tops to stand 6 inches above the trevise-boards, and to be rounded. The height of the fore-posts to be 9 inches above the top of the racks, 4 inches and a half by 2 inches, the foot of each to be set in stones, one on each side of the boards, and a piece of wood the thickness of the trevise-boards fitted in between the posts above the trevise-boards. The trevises to be 8 feet long from the wall to the outside of the hind-posts. The trevise-boards to be 1 inch and a half thick, mortised 1 inch and a half into the hind-post, and properly nailed into the fore-posts with 20*d.* nails; and the boards to be put together on the joints with iron dowels, at 2*s.* to the hundred. The trevises to be 4 feet 6 inches high at the hind-

posts, and 6 feet high at the front posts, and to have angle spars or warpings (diagonal braces) on each side 4 inches by 1 inch and a half, and properly nailed.

1213. *Racks.* The racks to be 2 feet 10 inches broad, the sides to be 6 inches by 2 inches and a half, and the spars to be 2 inches and a quarter by 1 inch and a quarter, sunk five eighths of an inch into the sides, at the distance of 3 inches and a quarter apart, and well nailed.

1214. *Mangers.* The mangers to be 20 inches at the top by 16 at the bottom, and 10 inches deep; the wood to be 1 inch and a half thick at the bottom, and the sides to be 1 inch and a quarter thick. The under racks (standard racks, or racks standing on the ground) to be 2 feet 3 inches high; the rails at the top and bottom to be 3 by 2 inches and a half, and to have a run-beam (front rail) rounded on the top, 4 by 3 inches, fixed along the top of the racks, with rings for securing the horses. Each box or manger to have a back lining or skirting on the top, where it joins the wall, sloping backwards, to prevent any of the corn from being lost. A piece of bond wood, 5 by 3 inches, to be built into the wall for fixing the harness-pins.

1215. *Plaster-work.* The stables for saddle-horses and the boiling-houses to get all one coat of plaster on the walls, and the ceilings to be all lathed and plastered round the back of the cupples and balks with two coats of plaster. A ventilator to be made in the ceiling of the boiling-house. The front walls of the work-horse stable also to get a coat of plaster, to prevent the harness from being injured by rubbing against the rough wall. The dressing-barn and granaries all to get one coat of plaster, and especial care to be taken to have the plaster applied close down to the floors, and close up to the under side of the boards over the joists, to prevent vermin from being admitted.

1216. *Slate-work.* The whole of the roofs to be covered with Easdale or Ballachoulish slates. The slates to have 2 inches of cover over the nail at bottom, and diminishing gradually to 1 inch and a half at the top, all being put on with nails of 12 lbs. to the thousand, and boiled in linseed oil. The whole of the ridges and flanks to be covered with milled lead 12 inches broad, 6 lbs. to the superficial foot. The piends (piens, or ridge pieces) to be covered with lead 10 inches broad, 6 lbs. to the superficial foot.

1217. *Court or Yard Gates.* The gate-posts to be sunk 3 feet into the ground, and burned or charred as far as they go into the ground; the posts to be 9 inches square, champhered on the corners, and set 3 inches clear of the pillars, and to stand 9 inches above the gate, rounded on the top, and built in the ground with stone and lime 4 feet in diameter. The hanging style of the gate to be 5 by 4 inches; the falling style to be 4 by 3 inches; centre piece to be 3 inches and a quarter by 2 inches and a quarter; angle spar to be 1 inch and three eighths thick, 4 inches and a half broad at the foot, tapering to 3 inches and a half at the top. The uppermost spar to be of $1\frac{1}{4}$-inch iron at the end next the hanging style, diminishing to the falling style to three quarters of an inch; to go through the posts with a shoulder and an eye at the hanging style, and a screw nut on the end at the falling style. The crooks to be put into the gate-posts with nuts on the ends. The spars of the gate to be 4 inches broad at the hind end, diminishing to 3 inches and a half at the front, by 1 inch and a quarter thick; the intersections put together with $\frac{3}{8}$-inch screw bolts.

1218. *Painting.* The whole of the outside doors, windows, and gates to get three coats of oil paint, the windows to get a coat before being glazed.

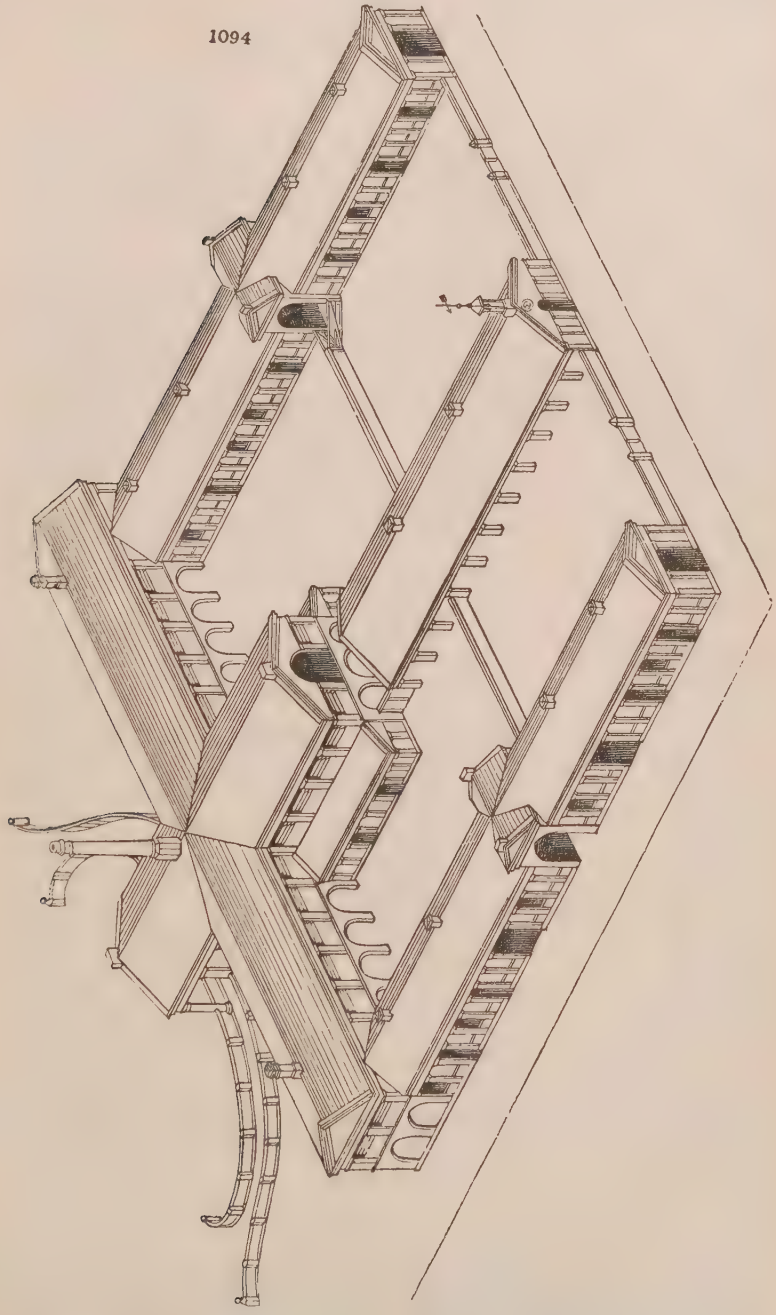
1219. *Wood.* The whole of the wood used to be of Memel timber, well chosen. The barn and granary floors may be laid with Dram battens.

Sect. II. *Examples showing the Manner of displaying Architectural Style in Farm Buildings.*

1220. *To display Style in Farm Buildings*, the main resource is the expression of the walls; and, as these are for the most part only one story high, it is chiefly to be effected by the vertical bond; or, in other words, by the supports of the roof. The form of the roof is also another source of style; and that of the openings, or doors and windows, a third source. Something also may be effected by the display of the ornaments peculiar to different styles; but this resource is altogether unsuitable for buildings of so simple a character as those in use for carrying on the business of a farm. The three styles most easily displayed in farm buildings are, the Grecian, the Roman or Italian, and the Gothic.

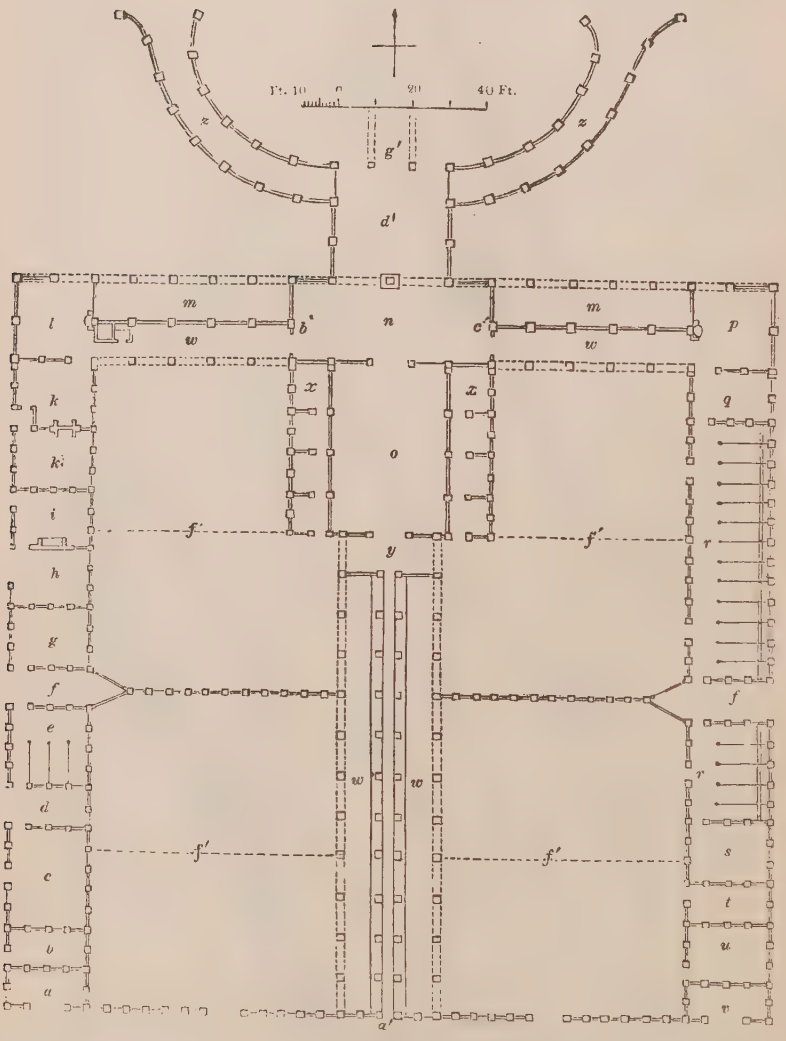
1221. *A Farmery in the Grecian Style* is represented in the perspective view, fig. 1094, the ground plan in fig. 1095, and the exterior elevations in figs. 1096 to 1098. On inspecting the ground plan, it will be found that, instead of common walls, the foundations of the different buildings consist of pillars, either equidistant, or at double distances from each other. The smallest distance between these pillars or piers is such as is considered suitable for the opening of a door or window; so that, by removing a pillar, an opening of a double width is formed, or one suitable for a cart or carriage way. In the plan before us, fig. 1095, we have adopted such a width as is not only

1094



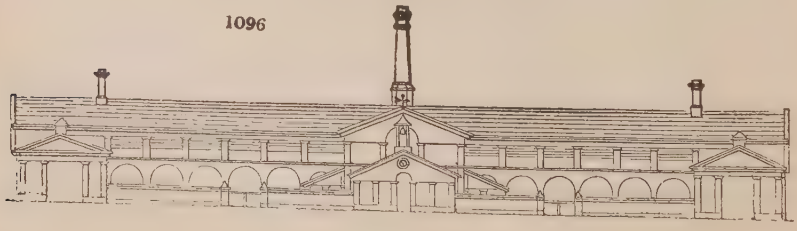
suitable for a door or window, but also for a single stall in a stable or cow-house, viz., 5 feet and a half from centre to centre; but this is by no means necessary, and we have only adopted it for the sake of illustrating some observations on temporary and portable

1095



farmeries, which will be found in our succeeding subsection. The buildings on the north side of the square are two stories high; and the foundations of the pillars are

1096



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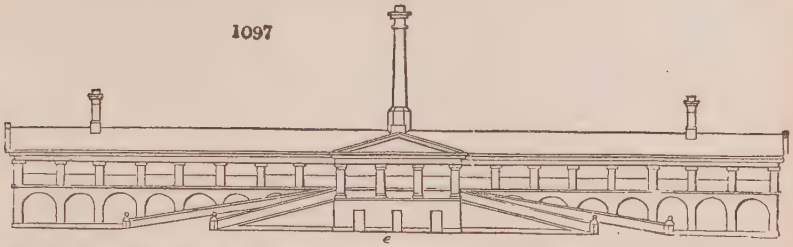
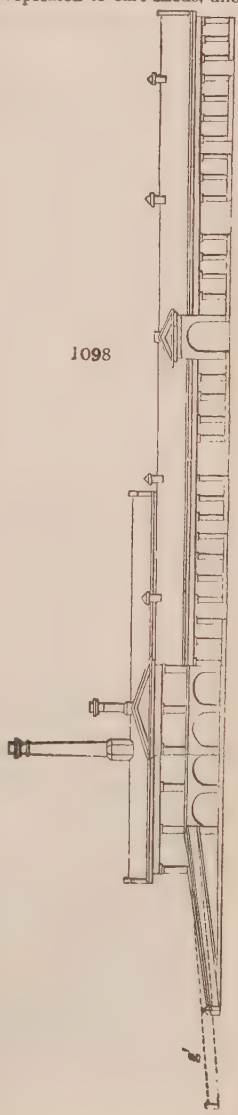


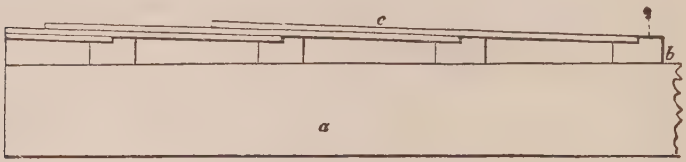
shown larger, and at exactly double the distance apart, centre from centre; because the lower part of this building, on the exterior side, is chiefly appropriated to cart-sheds, and on the inner side to cattle-sheds. The elevations show at once, to an architectural eye, how much is to be made of these piers. That of the east side is not given; but a glance at the plan will show to every Architect that it will be by far the handsomest. The panels, or spaces between the piers, may be filled up in various ways, according to the kind of materials which the locality affords; the plinth or base on which they are placed being, in every case where permanency is any object, formed of brick or stone. On the supposition that brick is the material employed, all the small piers may be 14 inches on the side, all the large ones 18 inches, and all the panels filled in with brick in bed, or 4-inch work. This 4-inch work may be either kept in the middle of the line of piers, as in the plan, fig. 1098, or, what would be preferable, as showing the pillars on the external elevation in bolder relief, ranging with the inside pillars. In countries where freestone is the cheapest building material, the small piers may be of the same width on the face; but instead of projecting from the panels 5 inches, as in the case of the brick piers, they may be flush with the walls in the inside, and only project 8 inches on the outside; the piers being of hewn stone, and the panels of common ashlar, in regular or irregular courses, as may be most convenient. Where a coarser and more unmanageable stone than freestone is used, the piers may be 18 inches or 2 feet in thickness, and the thickness of the panels may be 18 inches or 20 inches. In this case, in order to obtain the same room in the interior, all that is necessary is to place the piers a few inches farther apart, in order that the spaces between them may be of suitable dimensions for common doors and windows, and two of the spaces of suitable width for gateways for carts. The plinths below and the architraves above should always be of stone; the latter worked in the same manner as the piers or pillars, and the former in a coarser style. In countries where timber is the principal building material, the plinth ought to be of stone or brick, the piers and architraves of squared timber, and the panels filled in with studwork, either lathed or plastered on both sides, or covered with weather-boarding outside, and lathed and plastered inside. The roofing to a farmery in this style should, of course, be at a low or Grecian pitch; and we should prefer slight iron rafters, judiciously combined of cast and wrought metal, with rebated laths, in Tugwell's manner, or a corrugated iron roof. In cold climates, prepared paper, or, in warm climates, composition or cement may be used. If the roof were to be made perfectly flat, tiles covered with Roman cement in three coats and courses, would be found to form one of the most efficient and durable of roofs. As we prefer slates, and Tugwell's manner of laying them appears to us a decided improvement on that in common use, we shall here shortly describe it.

1098

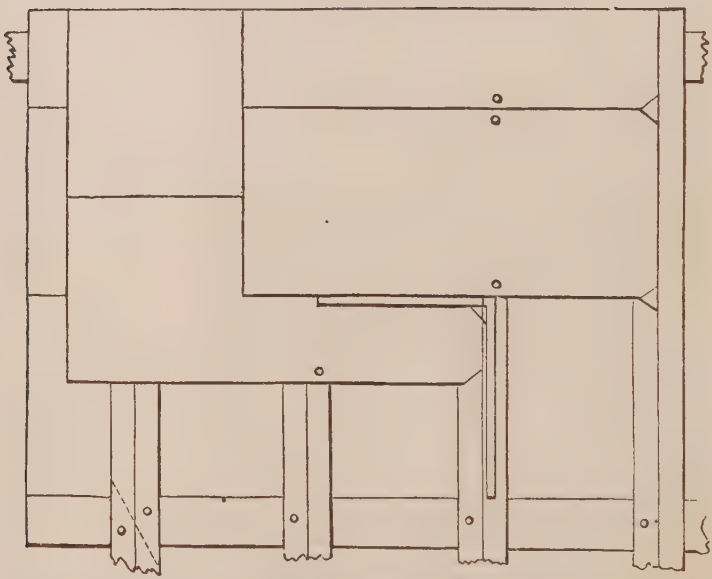


1222. *Tugwell's Mode of Slating.* The chief peculiarity of this mode consists in using rebated laths; the upper half of the lath rising above the lower half, as much as the thickness of the slate; by which means the slate incumbent on the upper part can be nailed in its middle. The laths are 2 inches wide and an inch thick. Fig. 1099 is a section of part of a roof slated in this manner: in which *a* is a rafter; *b*, the laths; and *c*, the slates. Fig. 1100 is a plan, or vertical profile, of a portion of the

1099



1100



same roof. "The laths, in the mode of slating generally practised, are made of deal only an inch in width; and, as a nail piercing the slate lying on such inch-wide laths will appear to have fastened it to the middle of that inch, the slate, with the wind lifting at its lower end, becomes a lever, with its fulcrum at the head of the nail; its short arm being only half an inch in length above the nail, and its longest arm (supposing the slates as in the figure, to be 18 inches long) 17 inches and a half below it; thus giving the wind a power to raise the slate as 35 to 1. In the method here proposed, that power will be only as 11 to 7; the short arm of the lever, in this case, being 7 inches long, and the other arm only 11 inches; which will, in all probability, enable the slate to resist the most violent hurricane or tornado ever experienced in Europe." (*Bath Society's Papers*, vol. x. p. 269.)

1223. *That, in point of accommodation,* no inconvenience will result from rendering a farmery architectural, will, we think, be obvious from going into the details of fig. 1095; in which are shown, a family potato-house, *a*; poultry-house, *b*; family cow-house, *c*; gig-house, *d*; gig and riding-horses table, *e*; gateways, *f*; tool-house, *g*; carpenter's shop, *h*; smith's shop, *i*; bailiff's house, *k*; house for boiling or steaming food for the pigs, family cows, and saddle-horses, *l*; cart-sheds, *m*; unthreshed corn barn, *n*; straw-room, *o*; place for boiling horse food, *p*; loose horse stable, *q*; stables for eighteen horses, *r*; fodder ing-bay, *s*; house for a bull, *t*; hospital or house for a sick animal, *u*; implement-house, *v*; cattle-sheds, *w*; pigsties and calf-pens, *x*; open space between the

cattle-sheds and straw-room for loading a cart with straw, *y*; and ramp or inclined plane for ascending to the unthreshed corn floor with loaded carts from the rick-yard, *z*. On examining this plan, it will be found as convenient as any of those which are composed without any regard to architectural style. It is intended for an arable farm under a six-course shift, in such a county as East Lothian. It will be observed that we have placed the chimney of the steam-engine centrally, for effect; a result that can easily be attained by a little contrivance in the disposition of the machinery, the engine-house, and the fuel-room. On the supposition that a farmery of this kind were occupied by the proprietor, it would be found to combine a certain degree of elegance with a convenience of inspection not commonly to be met with in farmeries. The master may enter at *a'*, and proceed down the passage to *y*, having the cribs for the cattle of the yards on both sides; he may then enter the straw-barn, and ascend to the floor for unthreshed corn, out of which doors open to the granaries over *l*, *m*, *w*, and *p*; having visited these, he may either descend and return by *l*, inspecting all the houses on the west side; or he may enter *p*, and proceed through the stables, and the other houses on the east side. The bailiff's house will be found very conveniently situated, as he may enter *l*, and proceed by *u* to *n* and *o* (where the most important part of his charge lies), under cover, and with great facility. We have shown the barn with a portico and a semicircular ramp; knowing, from experience, that it is a great saving of labour to be able to cart in a rick direct from the rick-yard to the threshing-floor. The floor for unthreshed corn has two bays, *b'*, *c'*, where two different kinds of unthreshed corn may be kept, while a third sort may be stored, or carted in, as passed through the machinery at *d'*. We suppose that all the straw intended to be eaten is carried by a travelling shaker to a straw-cutting machine, and cut into lengths of from three to six inches, in which state it is supposed to be partially steamed, or moistened with salt and water, or both, before being put in the cattle-cribs or horse-mangers. There is abundance of room under the floor for unthreshed corn, not only for the clearing-room, chaff-house, engine-house, boiler, and coal-house, but also for a room for crushing bones for manure, bruising grain, cutting turnips, &c. Of the three small doors shown in the elevation, fig. 1097, at *e*, the centre one is to the places connected with the steam-engine, and the others to places in which bones may be crushed, or turnips sliced, &c. It may be observed, in favour of displaying architectural style in farm buildings consistently with good arrangement, that there are certain houses or places in every complete farmery, the situation of which may be varied considerably, and which may therefore be always placed where they will contribute most to symmetry or regularity: these are the houses for loose cattle or horses, the hospital, and the open shed or shelter for cattle. Should the yards in this farmery be thought too large, which they probably would in Northumberland, though not in East Lothian, they may be divided by walls or hurdles at *f'*.

1224. *With respect to the extra-expense of displaying Architectural Style in a Farmery*, much will depend on the kind of building material. In the case of bricks, the plan, fig. 1095, would obviously cost less than if the walls were solid, and nine inches thick; and, in the case of pillars of squared wood and panels of studwork, the expense would not be greatly increased; but in the case of stone the hewing of so many pillars would no doubt be attended with considerable outlay. From this, however, would have to be deducted the expense that would otherwise have been bestowed in hewing door and window coins, lintels, and sills. The roof, as we have already observed, need not be more expensive than in any common farmery. Half the expense of the ramp to the portico of the barn may be saved by carrying out, instead of the curved roads, one road in a straight line from the centre opening of the portico, as indicated by the dotted lines *g'* in fig. 1098, and the same letter in fig. 1095; the barn being wide enough to allow a cart to turn within it. The chimney to the steam-engine is shown higher than may be necessary; but as such chimneys are built of brick with a simple description of scaffolding carried up inside (the invention, we believe, of our friend Charles Capper, Esq., engineer, Birmingham), the expense is much less than might be supposed. The spire of the Tron Church, Edinburgh, was rebuilt, in 1831, in a similar manner. The ventilators over the stables and cow-houses are formed to imitate chimney-tops, in order to harmonise with actual chimneys in the bailiff's house and the smithy.

1225. *A Farmery in the Roman or Italian Style* would differ little from the preceding Design. The piers might either support architraves or arches; for both would be alike Roman or Italian. The roofs ought to project farther, for the sake of shade to the windows and doors; and the windows ought not to be carried down so far as in the Grecian Design, but rather to exceed in breadth than in height; the architrave, or, in the case of arches, the soffit, forming the lintel of both doors and windows. To complete the idea, whether of the Roman or Italian style, the semicylindrical tile of Mr. Peake, fig. 24, § 50, may be used. An improvement on this tile, by Mr. Peake, and a

beautiful pattern for the joint tile to be used at the eaves, will be hereafter figured and described.

1226. *The Gothic style* may be displayed, in farm buildings, either by piers in the place of the Grecian pillars, with the heads of the panels pointed, and high steep roofs, as in fig. 788, § 752; by angular piers, terminating in low roofs; by buttresses, with parapets, and a moderately high roof; or by pointed openings and parapets, with battlements.

1227. *The Old English Cottage Style* of building might be easily conferred on farmeries by steep roofs, covered with plain tiles, with barge boards at the gable ends, and latticed windows.

1228. *The Swiss Style* would require far-projecting roofs, and there might be a continued gallery or veranda round both the exterior and the interior of the low buildings, which would also be found useful in various ways.

SECT. III. *On constructing temporary, portable, and ambulatory Farmeries, and on altering Mansions, Monasteries, Manufactories, and other Buildings, so as to render them fit for agricultural Purposes.*

1229. *A complete Farmery* can seldom be required to be constructed either in a temporary or portable manner, or for the purpose of being readily moved from place to place; but in all countries where the farms are large, and the farmers men of considerable capital, it will, occasionally, be desirable to thresh out corn on the spot where it grew, and to consume the straw, or to convert it into manure there.

1230. *The Construction of a Temporary Farmery* is founded on the same principle as that of the Grecian Design, § 1221; that is, all the walls are formed of props at regular distances, and these distances are such that the space between the props is of suitable width for a door, a window, or a stall for a horse or cow; while the removal of a prop affords a suitable opening for a cart or carriage. The panels between the props may be filled in with wattled work, faggots, straw, hurdles or matting, or clay nogging; or with slight horizontal rails, to be clothed with fronds of spruce fir, furze, broom, holly branches, &c. All the doors may be formed of wattled hurdles, as may also the shutters for the openings to be left as windows. The props, or posts, may be formed of young trees of any kind, more particularly larches, or spruce fir, with the bark on, and the lower ends charred; or, if the bark be removed, the extreme ends may be charred, and the entire prop kiln-dried and smoked with wood, so as to have its exterior surface powerfully impregnated with pyrolignous acid. The spray of hard-wooded trees, such as beech, elm, oak, ash, birch, &c., is preferable to that of resinous trees for producing this smoke; and if the kiln be close at top, with no other opening than the door, a very few faggots will suffice to keep it filled with smoke for several weeks. All the tie-beams may consist of young straight spruce fir trees, and they ought to project so far at the eaves, as completely to protect the side walls; across them may be laid branches, and thatch over the whole, to be held on with turf. In some cases, a roof of shingles, tiles, or prepared paper laid on thin boards, or of corrugated iron, § 420, may be preferable to those of a more temporary description. In Poland, America, and other countries where timber is abundant, farmeries of this kind, if proper pains were taken to char the ends of the props, and to put on a roof that would completely exclude the weather, would last as long as the oak-built farmeries of England, some of which have stood for centuries.

1231. *A Portable Farmery* might be easily formed by having the props made to stand on stone, slate, or tile plinths, and the tie-beams of the roof made to fix on the tops of the props by wooden pins. All the rest is easy and obvious. Instead of wooden props and tie-beams, slight props of cast iron might be used with tie-rods of wrought iron, and all the roofing and panels might be formed of corrugated sheet iron. Well tarred or painted, such a farmery would last at least during a twenty-one years' lease; and the time may probably come when farmeries of this kind will be erected by the tenant, as being cheaper than paying a high interest to the landlord for fixed buildings. In some parts of the country it might be cheaper to form the panels and doors of slate, of boards, or of wattled hurdles plastered, or the interstices stuffed with moss; or they might be formed of clay nogging or straw matting; but nowhere, we believe, could roofing of a durable nature be found cheaper than of corrugated iron.

1232. *An Ambulatory Farmery* may seem to some a visionary structure; but there are already ambulatory covers to ambulating threshing-machines, and there seems no reason why there should not be ambulatory barns, granaries, and shelter-houses for cattle. In France the shepherds have ambulatory houses, which are placed on wheels, and dragged from one part of the farm to another, as the pasturage of the flock or herd is changed. We have seen, § 1038, Mr. Taylor's ambulatory sheepfold; and it is evident that the sides of any building might be formed and placed on wheels in a similar manner. The floor, where a boarded floor was necessary, and also the roof, could be

transported on wheels; or every particular building or apartment requisite might be framed and placed on wheels, so as to be dragged from place to place by horses or steam, in the manner of our ambulatory cottages, § 516. When steam shall once be employed in agriculture, not only for threshing, but for cutting all the straw not to be used as litter or thatch, into short lengths, and for ploughing, harrowing, hoeing, &c., great changes will be required in the arrangement and construction of farmeries; and the hints in this subsection are thrown out to give Architects some idea of their resources.

1233. *Substitutes for the Walls of Straw Yards*, Mr. Taylor has shown, § 1038, may be formed in the most economical manner of bush faggots; and, indeed, in countries where capital is scarce among farmers, bushes, furze, straw, and clay form almost the only materials used in the construction of farmeries. This is a good deal the case in some parts of Huntingdonshire. The timber for the roof, in such cases, consists of willow or poplar trees, with the bark on. In Norfolk, Suffolk, Kent, and various other parts of England, the straw-yards are enclosed by wattled fences, and sometimes even by wattled hurdles. The low price of labour, and the circumstance of wood being the sole or principal fuel, render temporary means of this sort more economical than may at first sight appear. At all events, in a work like the present, intended for new countries as well as old ones, different means of effecting an end ought to be pointed out; not always as subjects for imitation, but for the sake of leading to comprehensive views.

1234. *The Alteration of Buildings of different Kinds, so as to render them suitable for agricultural Purposes*, though very uncommon in Britain, is yet frequent on the Continent. Monastic buildings of every kind, even churches and chapels, have been converted, not only into manufactories, barracks, and dwelling-houses, but into barns, stables, cattle-houses, and other buildings requisite for carrying on the operations of agriculture, in almost every part of the Continent, from Riga to Naples. As these buildings are seldom more than two stories high, and as they generally spread over a considerable surface, and are placed in the form of a quadrangle open to the south, they make, at little expense, very excellent farmeries and farm-houses. The ground floors are employed for lodging animals, and for storing roots and other food, and the floors above are used as granaries, for the farmer's dwelling-house, and as lodgings for his servants. The upper floors are sometimes, in Poland, used as hay and corn barns, the window openings being, in that case, left without glass. In one instance we recollect having seen the upper floor converted into a sheep-house, the sheep entering by an inclined plane, formed from a ruined part of the building, at one end. It is much to be regretted that large buildings, erected at enormous expense, should not be converted, when their owners can no longer afford to dwell in them, or when, from any other cause, they are obliged to be sold, to some useful purpose, rather than suffered to go to decay, or be pulled down. For this reason we shall briefly point out how mansions of different kinds may be converted to agricultural purposes.

1235. *To convert Mansions into Farm Buildings*, the first object is, to consider whether the accommodation is contained in several stories in height, or spread out to a considerable extent in length and breadth. The former class of buildings include most Gothic and Elizabethan mansions, which, it must be acknowledged, are much better adapted for being changed into manufactories, colleges, inns of recreation, schools, or cooperative dwellings, than farmeries. Still, however, the ground floor, and the kitchen and stable offices, might be used for the latter purpose, and the upper parts of the building converted into a manufactory; in which case, one large steam-engine on the ground-floor might suffice for both establishments. But, even where it was necessary to use the second and third floors of houses of this description for agricultural purposes, they might be ascended by inclined planes, either formed on the outside of the building, or in the interior. In some of the large inns in London the horses are lodged both on the cellar floor and on the first floor, the carriages being on the intermediate or ground floor. The ascent and descent are by inclined planes, at an angle of from twenty-five to thirty degrees, kept well covered with litter. In country houses, however, where there is ample space, the inclined planes need not be so steep, and they ought not to be covered with litter; which is a clumsy contrivance, and, in London at least, renders the air of stables of this description intolerable. The upper floors of lofty houses should be used as wool-lofts, and for storing other bulky yet light articles; the next floor for poultry, rabbits, or other small animals; the floor below for ewes and lambs, or swine; the first floor for cattle and horses; the ground floor for barns, cart-sheds, tool-houses, &c.; and the cellar floor for storing roots. Where the mansion consists of only two, or, at most, three stories, as in most Grecian buildings, and some of the old English houses, the conversion is easy, and may follow in the manner common in Poland. We must confess we should deeply regret to see any fine specimens of Architecture occupied as farmeries; but as we have not a doubt that, with the progress of society, many such buildings in England will be sold by their present owners, we have thought it a duty to throw out these hints, with a view at least

of preventing them from being rashly pulled down. In comparatively uncivilised ages and countries, all great changes are accompanied with destruction; and much of the accumulated labour of mankind is lost for ever to society; but under a higher degree of civilisation, conversion takes the place of destruction, and things merely change their owners or their uses.

SECT. IV. *Designs for various Buildings, such as Corn-Mills, Kilns, Malt-houses, Cider-houses, &c., connected with Agriculture and rural Economy.*

1236. *The Designs to be included in this subsection* are such as do not necessarily belong to a common farmery; but which, nevertheless, form prominent structures in particular districts. We might have added considerably to their number, by including buildings for carrying on different manufactures of agricultural produce; such as crushing seeds for oil; extracting dyes from wood, weld, madder, &c.; preparing hemp and flax; making flour or starch, or distilling spirit from potatoes; making sugar from beet root, &c.: but such buildings come much more within the province of the engineer than the Architect, being altogether subordinate to the machinery which they are to contain. We have limited our designs to such as are of a more general description, and which are required in every country where corn and fruit are grown. These are the wind and water corn-mills, the hop-kiln, the malt-house, and the cider-house. We have also added an improved limekiln, as of essential importance in limestone countries; a brick or tile kiln, which will enable every farmer to burn his own bricks, and also to burn clay or lime, and even to serve for a malt or hop kiln, on a small scale, and for a variety of other purposes; and a poultry-house for farms where poultry are kept on a large scale. Among the letter-press accompanying these designs we have been fortunate enough to be able to include some of the best directions for the manufacture of cider, for the management of hop and malt kilns, and for the care of poultry, which have yet been published. The directions for managing poultry are from the pen of Mr. Main; and, we think, from their great simplicity, and from their being founded entirely on his own experience, that they will be found particularly valuable. We have added to the article some remarks, accompanied by Designs, relating to the management of poultry by cottagers, and especially by the wives of farm labourers, being particularly anxious to direct the attention of our readers to this subject. We may observe generally, respecting the Designs of this subsection, that we have confined our attention chiefly to economical arrangement, or, in other words, to fitness for the end in view. It would have been a most agreeable recreation to us to have bestowed more attention on the architectural style of the different buildings, but we feared that this would have drawn the attention of our readers from the ground plans. Almost all of them, however, might be rendered highly architectural, and this every Architect will readily assent to when he finds that the ground plans of the chief of them, when constructed on the best principles, such as the windmill, malt kiln, hop kiln, &c. are circular. There is nothing in the nature of a circular kiln to prevent it from assuming the forms and proportions of the temples at Tivoli, or the Temple of the Winds at Athens; that is, if such models ought to be imitated in such cases.

Design I. — *The Construction of a Building for containing the Machinery of a Corn-Mill to be impelled by Water, with introductory Observations on Buildings for Mills generally, on Flour-Mills, and on the different Kinds of Water-wheels.*

1237. *Buildings for containing Mills* require to be of greater strength than ordinary farm buildings, chiefly on account of the vibratory motion communicated by the action of the machinery. This vibratory motion differs materially in different descriptions of mills. Where the machinery is in a great measure independent of the building, and is placed on the ground floor, as in the case of the threshing-machine, it is trifling; but where the machinery is so connected with the structure as to be inseparable from it, or is in an upper story as in the case of the windmill, the vibration is considerable. In cases of the latter description, the side walls of the buildings must be securely tied together by the system of flooring, and the walls must be thicker than in a common house of the same height; they must be begun on solid foundations, and carried up in the most substantial manner, with the best materials. As in this part of our work, it is chiefly our object to illustrate by example, we shall make no further observation, but refer to the plans, elevations, and specifications of Unsted mill, which forms the main object before us, previously introducing some remarks on mills generally, on flour-mills, and on water-wheels, most obligingly prepared for us by our valuable contributor, Mr. Varden.

1238. "*Mill*, in its most general signification, applies to all machines whose action depends on a circular motion. Of these there are several kinds; and, according to the various methods of applying the moving power, they are called windmills, water-mills, horse-mills, or steam-mills. All of these kinds are employed for numerous purposes,

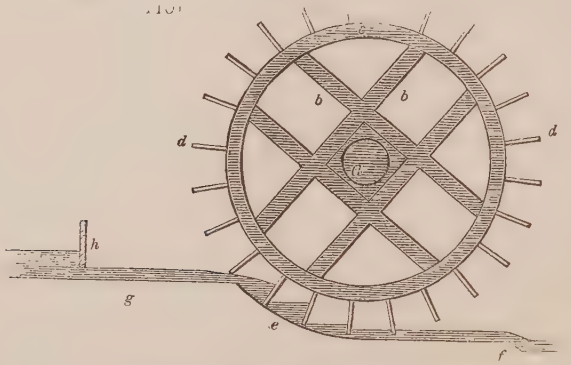
and are named according to their several uses; as corn, snuff, bark, colour, fulling, gunpowder, cotton, linen, oil, paper, sawing, sugar, or threshing mills, &c. Of these, corn-mills are the most important, as they are requisite to convert corn into flour, the state in which it is most fit for the food of man, and they are on that account indispensable in all civilised countries.

1239. "*Corn Mills.* Few persons are ignorant that corn is ground between two stones placed one above the other without touching. The lower millstone is immovable, but the upper one turns upon a spindle. These stones are usually from about 4 feet to 6 feet in diameter, and vary in thickness from 12 to 18 inches. The opposite surfaces of the two stones which are to grind the corn are not plane or flat; but the upper one is hollowed about an inch, and the under one swells up about three fourths of an inch, so that the two millstones come nearer and nearer towards the circumference, whereby the corn that falls from the hopper has room to insinuate itself between them, as far as two thirds of the radius, which is the place where it begins to be ground, and where it makes the greatest resistance it is capable of; the space between the two stones being in that place about two fifths the thickness of a grain of corn. But as the millers have the power of raising or sinking the upper stone a little, they can proportion the distance from the lower one according as they would have the flour finer or coarser. The stone used for grinding corn was formerly brought from France, and was called burr stone; but, latterly, stones proper for this purpose have been discovered in different parts of Britain. From a quarry near Conway, great quantities are dug every year; and when first cut out, they are much softer, and more easily worked than when they have been exposed to the air; even a single day makes a difference. From Abbey Craig, near Stirling, a great number of millstones are sent to various parts of the kingdom, that are considered to be in some respects superior to the French. In order to cut and grind the corn, both the upper and under millstones have channels or furrows cut in them, proceeding obliquely from the centre to the circumference; and these furrows are each cut perpendicularly on one side and obliquely on the other, into the stone, which gives each furrow a sharp edge. In the two stones they come against one another like the edges of a pair of scissors, and cut the corn so as to make it grind the easier when it falls upon the plane between the furrows. These are cut the same way in both stones when they lie upon their backs, which makes them run crosswise to each other when the upper stone is inverted by turning its furrowed surface towards that of the lower. When the furrows become blunt and shallow by constant wear, the running stone must be taken up, and both stones new dressed with a chisel and hammer. But, by this operation being often repeated, their thicknesses, and consequently their weight, are diminished; and it has been observed, that, when they have lost one fourth or one half of their original thickness, they produce but three fourths or one half the flour which they did when new. The circular motion of the upper millstone brings the corn out of the hopper by jerks, and causes it to recede from the centre towards the circumference, where, being quite reduced to flour, it is thrown out by the centrifugal force of the stone through a hole provided on purpose. Millstones will commonly last from thirty to forty years.

1240. "*Water-Mills.* In water-mills the moving power is the momentum of the water, communicated to the wheel; and it is used in three different ways: first, where the force of the water is applied from below the wheel, which is called an undershot wheel; secondly, where the water strikes nearly against the middle of the wheel, which is called a breast wheel; and, thirdly, where the water is applied above the wheel, which is called an overshot wheel. Of these, the first is the least, and the last by far the most, powerful."

1241. "*Undershot Water-wheels* in a great measure act by the impulse of flowing water and are considered to be the most ancient form of water-wheel. At first they were wheels provided with vanes or wings on the circumference, called floats (see *d*, in fig. 1101), and were placed in a river or running stream; the floats at the lower part of the wheel being placed so as to dip into the stream in such a manner as to intersect the water. But, in wheels constructed thus, when the planes of the floats become perpendicular to the direction of the current, or nearly so, they will resist or oppose the motion from it, in proportion to the quantity of motion they have abstracted from the water of the stream. The power thus obtained will be found to be only a small proportion of the power of the stream; because the water easily escapes sidewise from the floats, particularly if it should be attempted to take away any considerable share of its velocity by resisting or loading the wheel, so as to make it move slowly. This being discovered, it became an obvious improvement to contract the stream to the exact size of the float-boards of the wheel, or to make a close channel into which the wheel might exactly fit. The next improvement was, to intercept the river or stream of water by a dam or obstacle, in order to make it pen up or accumulate, till it had risen to the greatest height which could be obtained; and to let the water out of the dam or reservoir into the

channel or wheel-course through an aperture level with the bottom of the wheel course. In this way the water is urged by the pressure of the water in the dam, and rushes out from the aperture in a stream or spout, with a velocity proportionate to the perpendicular pressure, striking the float-boards of the wheel, so as to urge them forward. Such is the form of the undershot wheels still generally employed in France and other parts of the Continent; but in England they have long been superseded by more effectual applications of the water, and are very rarely met with. Undershot wheels of this description are generally called groundshot wheels, because the water shoots along the ground or floor of the channel in which the wheel works. Fig. 1101 is the vertical

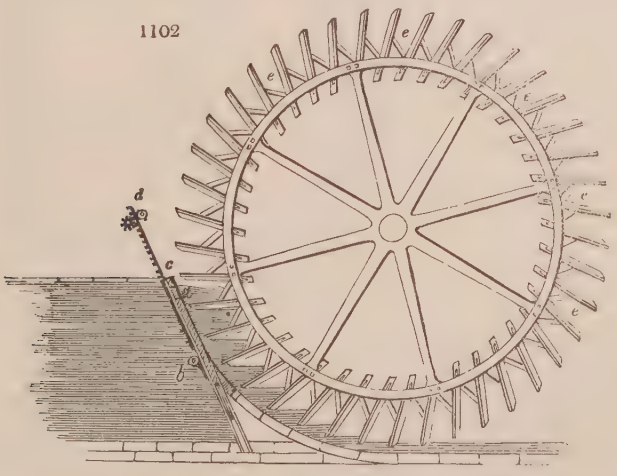


section of an undershot wheel, as now in use; in which *a* is the axis, which, if not of metal, should be made of hard and durable wood, of a length and size proportioned to the size and weight of the wheel. Into each end of this axis a gudgeon or centre-pin should be fixed, for the wheel to turn upon. There are two methods of fixing the gudgeon into a wooden axis: one is by forming the gudgeon with a cross, which is let into the end of the tree, and fastened by screws, the wood being compressed round the cross by two or three iron hoops, fitted on the end of the tree, and wedged. The other method is, to make a strong iron box in a piece with the gudgeon, into which box the end of the tree is received and secured with wedges: in the latter case, the box being of an octagonal shape, and the wood being cut to the same form, it cannot slip round with the box. Of late years it has been usual to make the axis of water-wheels of cast-iron tubes, which is a very good plan if they are of sufficient dimensions. In an iron axis, it is advisable to make the bearings of the axis close to the side of the water-wheel; and to leave the ends of the axis projecting beyond the bearing, in order to attach the cog-wheel. This diminishes the length of the axis between the bearings, and renders it much stronger. The arms supporting the circular rim of the wheel *b b*, are usually eight in number, framed together so as to intersect each other at right angles, and leaving a square opening in the centre for the reception of the axis; the corners round which being filled up by adding pieces of wood to it, and the wheel being fastened on by wedges. The only objection to this mode of framing is, that the arms are weakened by intersecting each other; and support the circular rim of the wheel in unequal segments. but on the whole it is considered superior to the method of mortising diverging arms into the axis, because by so doing the axis is much weakened, and the water, being admitted into the centre of the tree, soon causes it to decay. Another objection is, that an arm cannot be easily replaced without taking all the wheel to pieces. The very best method of uniting the arms to the axis is to have a cast-iron centre-piece, or strong hoop, to fit on the axis, with a broad projecting flanch round it, against the flat surface of which the arms of the wheel are applied, and the intervals between them are filled up by wooden blocks or wedges: the arms and blocks are firmly bound to the iron flanch by iron rings applied to the arms on the opposite side to the flanch with screw bolts to go through the whole. The circular rim, *c*, is made of wood put together in two or three thicknesses, the joinings of one ring not coinciding with those of the other; and there being eight or ten segments in each thickness, according to the size of the wheel. The thicknesses are united by rivets. The arms are attached to the ring by notching them into it, and securing them by bolts. Cast-iron rings are now generally used, and with great advantage; because the necessary mortises can be made in the iron without weakening the ring, but the strength of a wooden ring is greatly impaired by the mortises through it. The number of rings in a wheel must depend on its breadth; when the wheel is 4

feet wide, two rings will support the float-boards; but the rings should never be more than 5 feet asunder, or the float-boards may bend. Each ring is formed with its separate set of arms, so that every one derives its strength from the axis. When a wheel is of very great breadth, much additional strength may be gained by bracing it obliquely. The float-boards, *d d*, are twenty-four in number: they are formed of wood, and are nailed to pieces of wood called starts, which are fixed into mortises in the rings, and project outwards for that purpose. The velocity of the float-boards should be about equal to half the velocity of the stream; not more than one half of the float should ever be below the water, and from three to five should be immersed at once, according to the size of the wheel. When the stream is very rapid, the float-boards should be inclined towards the rim, so that the water may heap upon them, and act by weight as well as impulse. When the velocity of the stream is 11 feet per second or upwards, the inclination should not be less than 30 degrees; but as the velocity lessens so should the inclination diminish. When the velocity is only 4 feet per second or less, the floats should not be inclined at all, but should point to the centre of the wheel. To prevent backwater, the floats should be made to rise from the water as perpendicularly as possible. The circular sweep of masonry, *e*, is to prevent the escape of the water; the float-boards approach it as nearly as possible without touching. Beyond this sweep should be a step, or fall, *f*, of not much less than 9 inches, having a slope of about 45 degrees; in order that the tail-water may run off quickly, and not retard the motion of the wheel: beyond this step, the bottom of the tail-water channel should be paved for about 50 feet, having a declivity of an inch in every 6 feet: beyond this the bottom should slope about 4 inches the first 200 yards, 3 inches the second 200 yards, and decreasing gradually to the usual fall of the river. In places liable to floods, this fall must be increased so as to prevent the water running back upon the wheel. The tail-water course must be wider than the wheel. The slope *g* must be paved. The pen-stock is marked *h*. The diameter of the wheel should be the largest of which circumstances will admit; and, as it is of great importance that none of the water should escape without contributing to turn the wheel, either below the float-boards or at the sides, the breadth of the float-boards should be greater than that of the sheet of water that strikes them.

1242. "*Breast Wheels* are very commonly called also undershot wheels, because the water runs beneath the wheel; but they differ essentially, since the principal power is derived from the weight of the water, and not from its impulse. A breast wheel partakes of the nature of both over and under shot wheels, and is constructed as represented in fig. 1102. The lower part of the wheel is surrounded by a sweep of masonry,

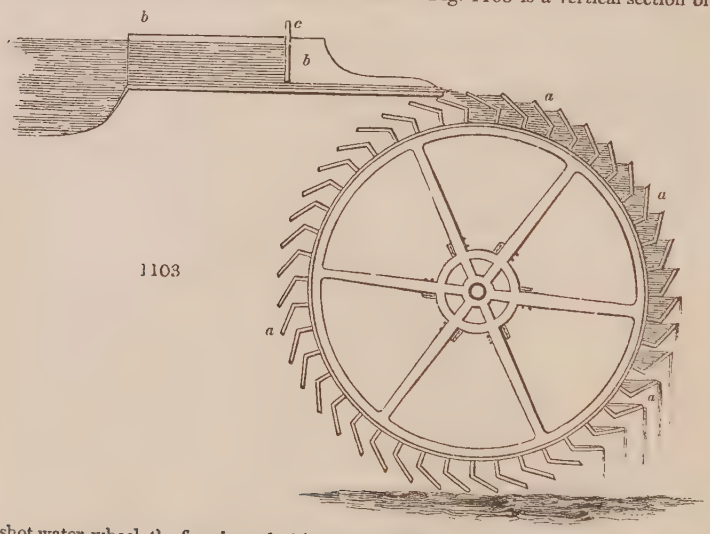
1102



which is made concentric with it; the float-boards are exactly adapted to this masonry, so as to pass as near as possible to it without touching, and the side walls are, in the like manner, adapted to the ends of the float-boards; the intention being, that as little water as possible shall be able to pass by the float-boards, without causing them to move before it. The water is poured upon the wheel over the top of the breasting at *a*; the efflux from the mill-dam, *b*, being regulated by the sluice or shuttle, *c*, which is placed in the direction of a tangent to the wheel, and is provided with a rack and pinion, *d*; by which

it can be drawn up, so as to make any required degree of opening, and admit more or less water to flow on the wheel. The framing of this wheel is all of cast iron; and the floats are forty-two in number. The water first strikes upon the float, and urges it forward by impulse; but when the floats descend into the sweep, they form, as it were, close buckets, each of which will contain a given quantity of water, and from which the water cannot escape except the wheel moves; at least this is the intention, and the wheel is fitted as close to the race as it can be with this view. The float-boards are inclined to the rim, and there are other boards, *e e e*, placed obliquely, which extend from each float-board to the rim of the wheel, and nearly fill the space between one float and the next. These are called rising boards, and the use of them is to prevent the water flowing over the float-board into the interior of the wheel. The edges of these boards are not continued so far as to join to the back of the next float, because that would make all the boards of the wheel close, and prevent the free escape of the air when the water entered into the spaces between the floats. In breast wheels, the greatest constant height of water should be made use of for the fall; as water acts with much more effect by its weight than by its impulse. Any greater height that the water in the mill-pool may attain in wet seasons can only be employed in the way of impulse, unless a shuttle be used, which would allow of the water being discharged at different levels: this is sometimes done, and it is considered to be a great improvement. The velocity of the floats of a breast-wheel should be from three to four feet per second.

1243. "*An Overshot Water-wheel* is simply a circular ring of open buckets, so disposed round the circumference of a vertical wheel, as to receive the water from a trough placed over it in such a manner as to have the buckets on one side of the wheel always loaded, while those on the other side are empty. The weight of water on the loaded side of the wheel will cause it to descend; and by this motion the water runs out of the lower buckets, while the empty buckets of the rising side of the wheel, each in their turn, come under the spout, and are filled with water. Fig. 1103 is a vertical section of an



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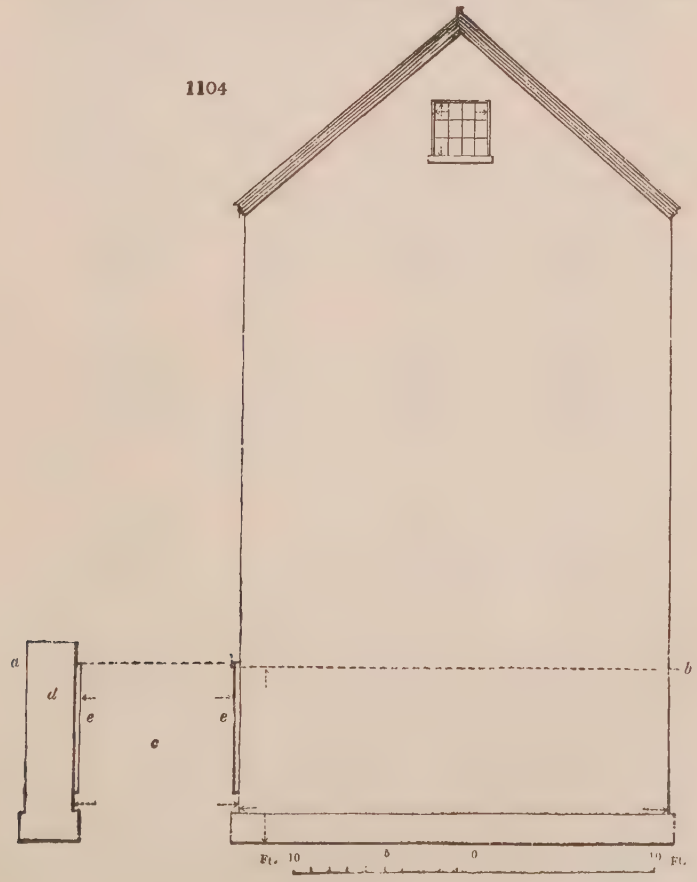
overshot water-wheel, the framing of which is of cast iron; *a a a a* are the buckets. As it is of consequence to have them so formed as to retain the water on the descending side as long as possible, much attention has been paid to their make: those in most general use are called elbow-buckets, because each partition is formed of two boards, which are put together with an angle or elbow; and this is the kind represented in the figure. It is a great advantage to make the partitions of the bucket thin; particularly the edges, which meet, and divide the stream of moving water flowing upon the wheel. If the edges are not sharp, they will splash the water about; and they are, therefore, generally finished by iron plate, or, what is better, all the inclined parts of the partitions are made of iron plate. The greater number of buckets, and the shallower they are, the more regularly the wheel will act. The mouth of the buckets should be of such a width as to allow the air to escape at the same time that the water flows in. To facilitate this, in some wheels, the buckets are made longer than the width of the stream of water acting on them, which allows the air to escape freely at the ends, and likewise affords

room for the water to spread. In this case, the buckets at the top of the wheel are not filled so completely as they otherwise would be, by which means less water is spilt when they first change their position, and, consequently, there is less waste of power, as the water is longer retained in them. The cast-iron trough for the water is marked *b*, and the sluice, also of iron, *c*. The inclined boards of the buckets should be exactly in a line with the stream of water when it issues from the spout, passing beneath it; and, if the edges are made thin, there will be but little splash. The velocity of the periphery of the overshot wheel should be from 6 feet and a half to 8 feet and a half per second, and the higher the wheel is in proportion to the whole descent of water, the greater will be the effect; provided the water, when it first impinges upon the wheel, has an equal or greater velocity than the bucket-boards; otherwise it will cause a splash, which will, in a slight degree, retard the motion of the wheel. A fall of two or three inches, in most cases, will be sufficient for this. A greater impulse in the water will of course accelerate the speed of the wheel; but the power will not be increased so much as if the diameter of the wheel were sufficiently enlarged for the water to act by its weight. In general, when the fall of water is between 4 feet and 10 feet, a breast wheel should be erected; an undershot should be used when the fall is below 4 feet, and an overshot wheel when the fall exceeds 10 feet."

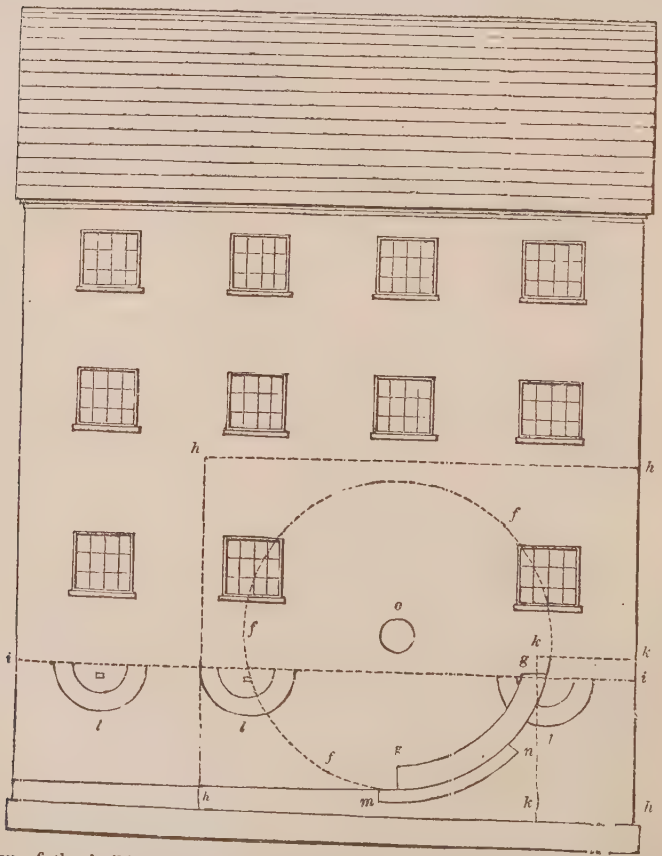
1244. *As an example of the kind of Building requisite for a Corn-Mill to be impelled by Water acting on a Breast Wheel,* we shall give the following, erected at Unsted Lock. It is one of a number of Designs that have been furnished us by John Perry, Esq., of Godalming, Surrey, which have been executed by him in that county and the adjoining one of Sussex. Fig. 1104, to a scale of 9 feet to an inch, is an elevation of the up-stream end of the building, the down stream end being the same. In this figure the dotted line

1104



a b represents the level of the water in the mill pond or head, below which the wall of the mill-house is of stone; *c* represents the thorough or space in which the water-wheel works; *d* is a stone wall; and *e e* brick cheeks, or facings, to confine the water to the wheel. (This Design, our readers will probably say, is plain enough; but in case they should wish to confer architectural style upon it, we shall show them how it is to be done. In the first place, more expression may be given to the walls by constructing them, or by exhibiting a style of construction founded, either on the wooden model or the stone model. By the wooden model, we mean the primitive style of building with timber, in which all walls are formed of a vertical bond of square pillars, and a horizontal bond of architraves or lintels placed over, or intersecting them. This may be exhibited with equal ease in a building constructed either of brick or stone; pilasters representing the vertical bond, and architraves the horizontal ties. The stone model is that in which small stones are used piled up in piers for the vertical bond, and forming arches in horizontal lines, or courses for the horizontal bond. This, it will be readily allowed, can be done with equal ease, whether the building is of brick or stone. Here, then, are the rudiments of two distinct styles of composition, of each of which styles there may be several varieties or manners, according to the kind of stone or brick used, and also according to the kind of timber imitated. We say nothing of the forms of the openings, or of the gable ends, which afford other sources of style and architectural interest, preferring, for the present, to leave the young Architect to develope and amplify the ideas which we have thrown out.) Fig. 1105 is an

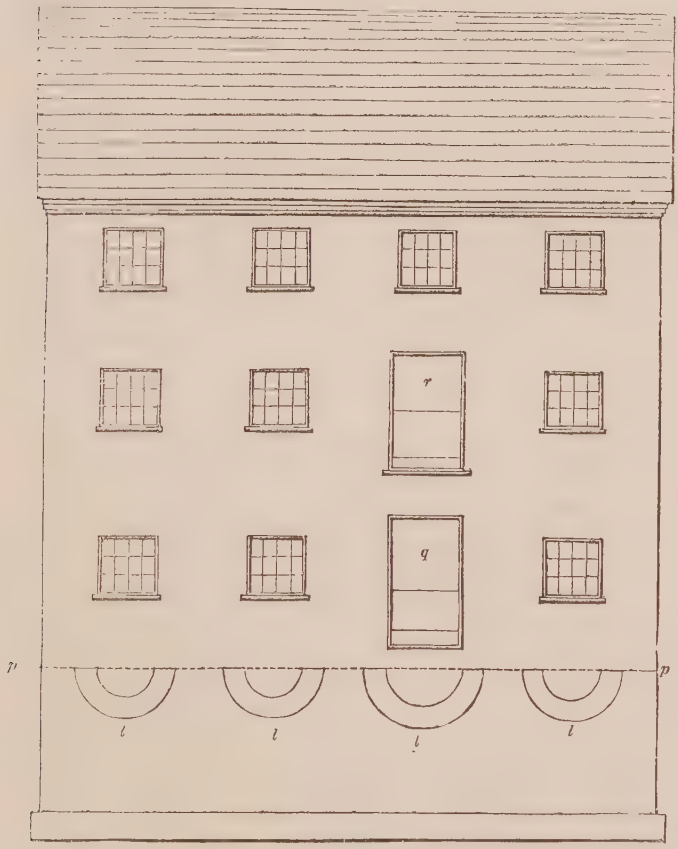
1105



elevation of the building facing the thorough, in which the dotted line *f f f* represents the circumference of the wheel; *g g*, the position of the cheeks, or offset of brickwork,

two inches in projection, to confine the water to the breast of the wheel: the same space indicates the proportionate extension of the buckets, relatively to the circumference of the wheel; the square included in the dotted lines *h h h h* is to be faced or built to the depth in the wall of nine inches with Roman cement; the dotted line *i i* represents the head-water line; the parallelogram included in *k k k k* is to be built solid in Roman cement; *l l l* are inverted arches under the windows; the line *m m* represents the top of the pavement of the race for tail-water way; *m n* is a space technically called the sweep, which is to be built of Pulborough stone (a species of green sandstone, found to resist the action of water, and which is cheaper than any other freestone in the neighbourhood of Godalming); *o* is the axle of the wheel. Fig. 1106 is the front

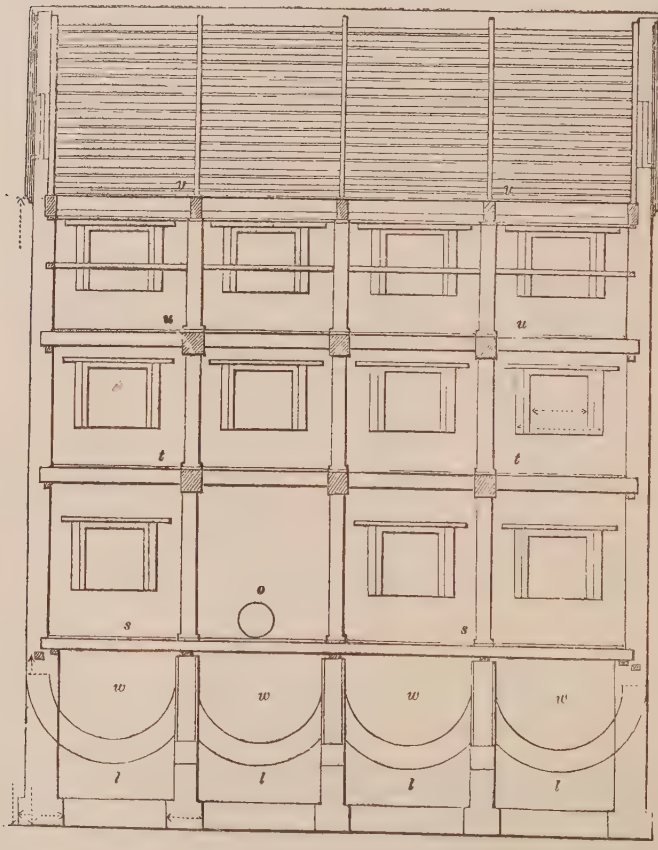
1106



elevation, in which the line *p p* represents the level of the head water, the wall below which is built of stone, and the wall above of brick; *q* is the main entrance, and *r* a door by which corn or flour is taken up or let down by means of a crane and pulley tackle; *l l l l* are inverted arches, as in the preceding figure. (In these two elevations our readers will observe that there is naturally more expression than in the end view, fig. 1104, on account of the number of windows. We shall now show how this expression may be increased, independently altogether of either the pilaster and architrave, or the pier and arch styles. In the first place, there is always a degree of expression given to a building when the openings are on one axis, or series of axes, both horizontally and vertically; or, in other words, when all the windows and doors of the different stories are directly over one another, and when all those on the same story have their sills and lintels in the same plane. To be convinced that this gives expression, it is

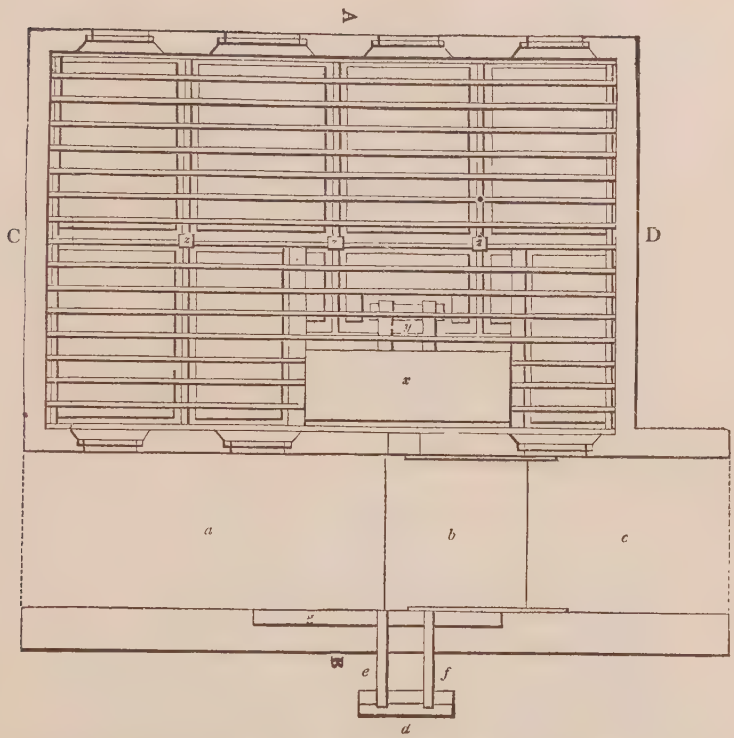
only necessary to suppose a contrary position of these openings, and to imagine the doors and windows placed at random. Now, the expression, produced by uniformity and continuity of axis, whether vertically or horizontally, may be greatly increased by lines expressive of this uniformity and continuity; for example, by a continuity of the sills and lintels horizontally, and of the jambs vertically, somewhat in the manner shown in fig. 459, § 532. It surely will be allowed that this would give a marked expression to the two elevations before us, independently of every other resource. The angles or corners of all buildings, it will be admitted, contribute to expression by the mere circumstance of their furnishing vertical lines: now, the expression of these lines may be heightened by doubling them, or producing the appearance of a bold, massive pier, pillar, or pilaster at the angle, and this, again, may be varied and heightened by giving the expression of the individual stones which compose it; either simply, as of stones of the same size; or, compoundly, by showing stones of different sizes, as in what is called in and out bond. Here, then, are two distinct sources of expression, which may be added to plain walls varied by plain openings.) Fig. 1107 is a section from *c* to *d*

1107



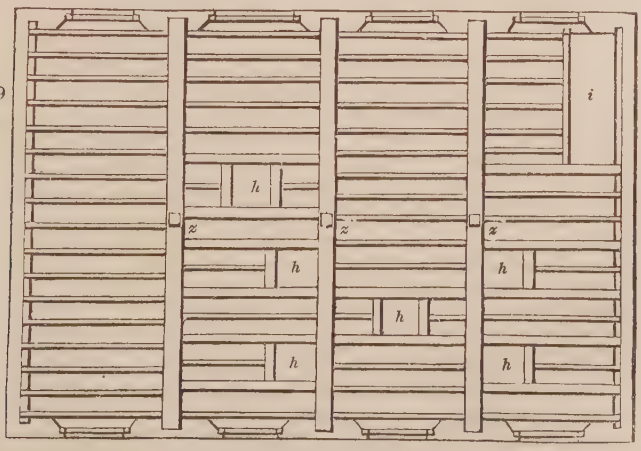
on the plan fig. 1108. In this figure, *l l l l* are inverted arches, and *o*, the axle of the wheel, as in fig. 1105; *s s* is the ground floor; *t t*, the floor in which the millstones work; *u u*, the warehouse floor; *v v*, the floor in the roof. The spaces *w w w w* are left open. Fig. 1108 is a plan of the ground floor, in which *x* is the cog-pit, or place for the cog-wheel, on the lying or horizontal shaft of the water-wheel, paved with brick; *y* is the bed or bolster of the gudgeon of the cog-wheel; *z z z* are the upright posts which support the stone floor; *a* is the brick on edge paving of the race, or tail-water

1108



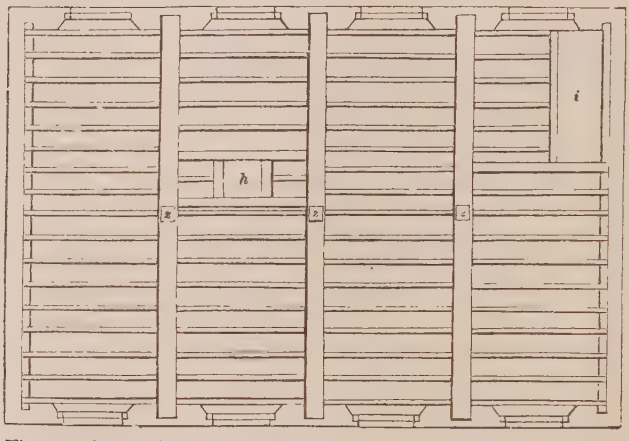
course; *b*, the Pulborough stone paving of the wheel sweep; *c*, the paving, forming the commencement of the sweep, under the buckets of the breast wheel, of Bargate stone (a species of hard limestone found in the neighbourhood of Godalming, more durable than the Pulborough stone, but not a freestone, and consequently worked by fracture, called heading or hammer-dressing, and not by the saw and chisel); *d*, *e*, *f*, and *g*, are pieces of oak for supporting the axle of the water-wheel. Fig. 1109 is a plan of

1109



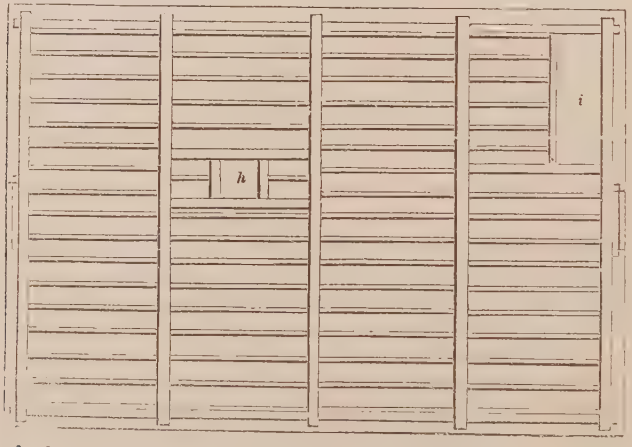
the stone floor; *z z z* are the continuation of the posts for supporting the floor above, *h h h* are trap doors for raising or lowering sacks of corn or flour; *i*, the stair or step

1110

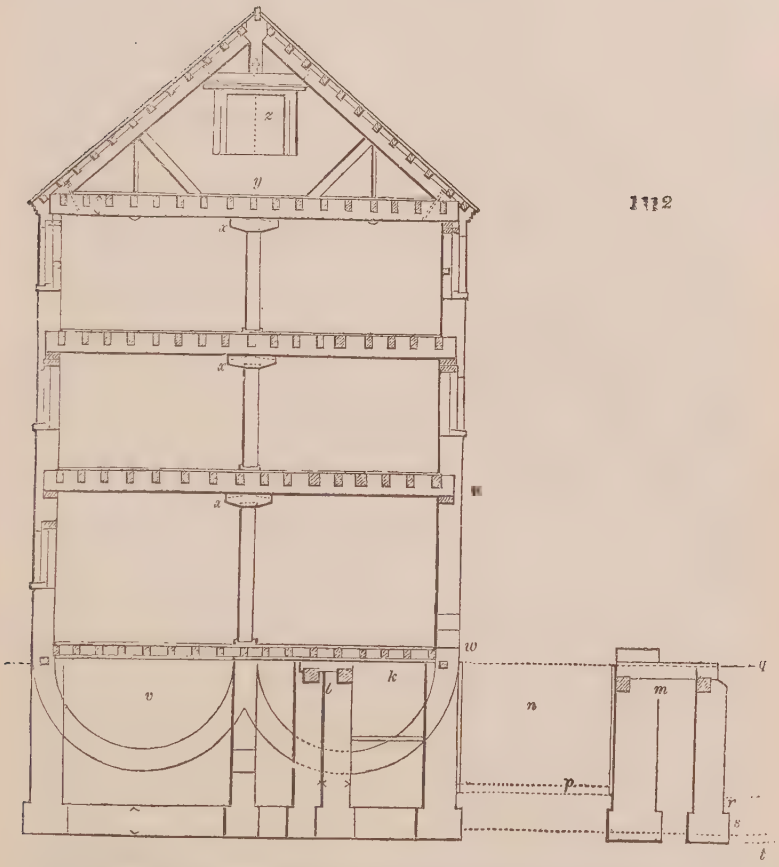


ladder. Fig. 1110 is the bin floor, in which may be seen the situation of the upright posts, the trapdoor, and the stair, as in the preceding figure. Fig. 1111 is a plan of

1111



the floor in the roof, showing a trapdoor, and a stair. Fig. 1112 is a section from A to B, in the plan, fig. 1108, in which *k* is the pit for the cog-wheel; *l*, the bolster for its axle; *m*, the bolster for the same axle, which passes through the water-wheel; *n*, the thorough, or place for the water-wheel; *o*, the centre of the axle of the water-wheel; *p*, the bottom of the water-wheel; *q*, the head-water line; *r*, the tail-water line; *s*, surface of a natural stratum of gravel; *t*, the bottom of the footings of the walls; *u*, the top of the water-wheel; *v*, the space between the inverted arches and the ground floor, filled in with masonry; *w*, the top of the stonework; *x*, caps to the upright posts; *y*, the floor in the roof; and *z*, the framing of the window in the roof. (As one great object which we have in view, in giving this plan of a watermill, and that of the windmill which follows, is to show the simplest mode of construction, with a view to their being adopted by residents in new countries, such as America and Australia, we may observe that the business of constructing the floors of mills is very much simplified, as well as their durability increased, where timber is abundant and cheap. In the interior of Poland we have seen windmills in which there were neither joists in the floors, nor standards nor quartering in the wall; both were formed of thick planking, closely joined by wooden pegs, or dowels, which served both for the skeleton and the covering; and in that country cost less altogether, than it would have done in Britain to saw up the same materials into joists, quartering, and boards.)



1112

1245. *Particulars* of the several works to be done in building a water corn mill at Unsted Lock, for J. S. Esq., according to the plans, elevations, sections, and details, and the conditions of the subjoined contracts severally signed by the parties undertaking the same.

1246. *Bricklayer's Work.* The trenches for the foundations of the respective walls and cross walls are to be dug out of the proper depth and width, and the ground round the same properly secured, filled in, and rammed round the work. The water to be raised from the cavities, and carried therefrom as occasion may require. All the bricks to be used in the building, or brought upon the premises, to be sound and good well-burnt stocks, those to the external parts of the building to be of an even colour, and the whole laid and flushed solid in mortar of the several heights and thicknesses with the apertures specified in the drawings; and none of the bricks to be brought upon the premises shall be slack-burnt, or over-burnt, but all warranted to stand the frost. The mortar to be composed of the best well-burnt grey lime, and clean sharp river sand, well tempered together. The work of the foundations, and up to within one foot of the upper side of the ground floor, to be of Bargate stonework, grouted with hot lime and sand every two courses, and with brick coins. The external face of the whole of the brickwork to be laid in a close, neat, flat-ruled joint; and the inside of the mill to be worked fair for lime-whiting, with a three-course Welsh cornice under the eaves, and on the gables. Nine-inch brick discharging arches to be turned over all the apertures to within 4 inches of the face of the respective walls, and common skew-back arches to be turned over the several openings externally. Fourteen-inch brick inverted arches to be turned the whole thickness

of the walls below the ground floor under all the lower tier of windows, doors, and story-posts. Openings through the external walls to be left to admit air under the boarded floor, on the ground story of the mill, where directed. All the plates, lintels, and templets to be properly bedded level; and all the windows and door frames pointed with good lime and hair mortar. If any damage should happen to all or any part of the brickwork or stonework during the progress of the work, either from the inclemency of the weather or other causes, the same from time to time to be repaired and pointed. The mill wall against the thorough (the space in which the water-wheel works) to be set in Roman cement, where shown in the plan. The bricklayer is to find scaffolding, and the fixing and refixing the same, and all manner of ropes, boards, ladders, tackle, tools, and things necessary for the business, and all the bricks, lime, and sand, and the carriage thereof; and all the materials, workmanship, and ironwork required for the completion of his work, in the best, most substantial, and workmanlike manner, except the Bargate stone. The bricklayer is to find and lay a sweep of Pulborough stone, 8 inches thick, set in Roman cement, and laid on a proper foundation; and to pave the thorough above the sweep (a surface of masonry concentric with the wheel) with Bargate stone, and below with bricks on edge set in mortar. The employer is to find and deliver on the spot the Bargate stones for the foundations at his own expense; but the bricklayer is to head and prepare them at his expense.

1247. *Plasterer's Work.* To dub out and plaster the space from the edge of the wall-plates to the underside of the respective floor-boards. To lime-white twice over the whole of the interior of the walls of the mill. The plasterer is to find all kinds of materials, tools, and the carriage thereof; and all the workmanship required for the completion of his work, in a sound and workmanlike manner.

1248. *Slater's Work.* The roof of the mill to be covered with the best countess slates, nailed with wrought copper nails, 1 inch and a quarter long, the eaves laid double. The slater to find all kinds of materials, tools, and the carriage thereof, and the workmanship required for the completion of his work, in a sound and workmanlike manner.

1249. *Mason's Work.* To put Yorkshire stone quarry sills, 8 inches wide, beveled, throated, and tooled, to all the windows, finding all materials, workmanship, fixing, and carriage.

1250. *Memorandum of Agreement* made this twenty-fifth day of April, 1831, between J. S. of G., Esquire, of the one part; and W. M. the elder, and J. M. of G., Bricklayers, Plasterers, and Masons, of the other part: viz.; In consideration of the sum of money, and the conditions herein after mentioned, the said W. M. and J. M. do hereby contract and agree to and with the said J. S. to perform the whole of the works described under the titles of *Bricklayer's, Plasterer's, Slater's,* and *Mason's Work,* in the foregoing particular, as the same are also exemplified in the plans, elevations, and sections, and details, which are identified by the signature of the parties hereto; and to complete the same in the best and most workmanlike manner, to the entire satisfaction of the surveyor appointed by the said J. S. to superintend the same, finding all materials, carriage, and workmanship of every kind soever, which may be required in the said works, except Bargate stone, and the carriage thereof, for the sum of two hundred and thirty-five pounds twelve shillings and sixpence; and to complete the whole of the said works as aforesaid, on or before the thirtieth day of July next ensuing the date hereof. And the said J. S. doth hereby agree to deliver upon the spot the Bargate stone required for the foundations, as described in the particular and drawings, and to pay unto the said W. M. and J. M. during the progress of the work, such sum or sums, on account of the said sum of two hundred and thirty-five pounds twelve shillings and sixpence, as the surveyor may direct; provided such sum or sums shall not exceed two thirds of the value of the work then done, and the remainder thereof on the thirtieth day of August next, provided that the said works are certified by the surveyor to be complete and finished according to the true intent and meaning of the foregoing particular and drawing referred to, and this agreement. And in case any difference or want of accordance shall appear between the drawings and the particulars, or any part thereof, the same shall be construed in the way most favourable to the substantiality of the work. And if any material shall be brought upon the premises which is disapproved by the surveyor, or any workman employed whose skill is considered insufficient by him, the said materials or workman to be removed or discharged immediately, upon the said W. M. or J. M. receiving notice from the surveyor so to do. And in case any alteration shall be directed by the said J. S. or his surveyor, in the nature of the work during progress, or any deviation shall be ordered by them from the foregoing particular and plans aforesaid, the same shall not vitiate or annul this agreement, but the difference shall be valued by J. P. of G., Surveyor, between the parties, and shall be added to or deducted from the amount of the present contract (as the case may be), and his decision shall be final. And further, if any or all of the said work should be performed in any way inferior to the description and intention of the

particulars and drawings, or shall be deteriorated below a fair standard of good quality or sound workmanship, the same shall also be valued by the said J. P. as aforesaid, and deducted from the amount of the contract by the said J. S., and his decision in this case shall also be final. Such parts of the work as affect or appertain to the machinery of the mill are to be done under the direction of W. B. of G., Engineer.

As witness our hands the day and year before written. J. M. for self and father.

Contract, £235 : 12*s.* : 6*d.*

1251. *Carpenter's and Joiner's Work.* The whole of the timber, except where otherwise mentioned, to be of the best yellow Dantzic, Riga, or Memel fir, of the several dimensions, scantlings, and framings as herein after described and shown in the drawings. The lintels to all the openings to be 4 inches and a half thick, with a 9-inch bearing on each pier beyond the splay of the jamb, and in width 4 inches less than the thickness of the respective walls. The wall-plates and rising-plate to be 5 inches by 3 inches, and 1 tier of bond, 4 inches and a half by 2 inches and a half, in the warehouse floor story, laid all round, properly halved and spiked at the laps, and dovetailed at the angles. An oak chain-plate is to be put in the centre of the external wall of the mill, all round, 5 inches by 4 inches, where shown in the drawings, well lapped and pinned at every length, and dovetailed and pinned at the angles. The centres to the arches, trimmers, and all other apertures, to be substantially made, fixed, and refixed, and left as long as may be necessary; and all moulds prepared and framed where requisite for the inverted arches, and other places where wanted. — Ground Floor. To have 2 oak front and back sills, 8 inches by 10 inches; 2 oak sleepers, 8 inches by 8 inches; 2 oak ground sills, 8 inches by 10 inches; fir joists not more than 12 inches apart, 7 inches by 2 inches and three quarters, laid on oak sleepers, 4 inches wide, and 1 inch and a half thick. — Out Doors. Oak front sill, 10 inches by 10 inches; oak back sill, 9 inches by 9 inches; and 2 oak sleepers, 8 inches by 8 inches. — Stone Floor. To have 3 girders, 14 inches by 12 inches, with joists framed into the same, and trimmed to the stairs and sack-hole, 9 inches by 3 inches, not more than 12 inches apart, with trimming joists and trimmers, 9 inches by 6 inches. — Warehouse Floor. To have 3 girders, 14 inches by 12 inches, with joists framed into the same, and trimmed to the stairs and sack-hole, 9 inches by 3 inches, not more than 12 inches apart, with trimming joists and trimmers, 9 inches by 6 inches. — Floor in Roof. To have joists, 8 inches by 3 inches, not more than 12 inches apart, framed into the tie-beams, trimmed to the steps and sack-hole with trimmers and trimming joists, 8 inches by 6 inches. All the girders to be laid on an oak templet at each end, 4 inches and a half by 9 inches, and as long as the respective piers will admit. All the floors to be of good well seasoned yellow deal, listed, free from sap, wrought, and edges shot; none of the boards to exceed 5 inches and a half in width. The ground floor and stone floor to be 1 inch and a quarter thick; the warehouse floor and floor in roof to be 1 inch thick, rebated. There are to be 3 wrought story posts, with chamfered edges in each story, 9 inches by 9 inches, with an oak cap properly stub-mortised, 2 feet 6 inches long, and 8 inches deep, and 2 pairs of oak wedges to each, with a cast-iron sole piece to each story post. — Roof. Tie-beams joggled to the plates, 7 inches by 12 inches; framed principals, 8 inches by 3 inches and a half at bottom, and 7 inches by 3 inches and a half at top; struts, 6 inches by 3 inches and a half; collars, 7 inches by 3 inches and a half; king posts, 9 inches by 3 inches and a half, with $\frac{3}{4}$-inch iron screw pins, 18 inches long, with nuts mortised through the king posts; common rafters, 4 inches by 2 inches and a half, 13 inches apart, notched on the back of principals, and laid horizontally. The principals to be fixed to the tie-beams, as also the collars at each end to be fixed to the principals, with iron screw pins and nuts, and to put 6 $\frac{3}{4}$-inch wrought-iron screw pins with nuts, &c., as queens. The ridge to be of $1\frac{1}{2}$-inch yellow deal rounded for lead, 9 inches wide. The roof to be covered with $\frac{3}{4}$-inch white spruce slate boarding match planed, together with a $\frac{3}{4}$-inch feather-edge eaves board, 8 inches wide. To put inch yellow deal wrought and rounded window boards to all the windows. — Note. The windows, doors, and frames are to be of iron, and will be provided by the employer. The step-ladders to each story to be of 2-inch wrought yellow deal, the sides 9 inches wide, with the steps housed into them with 2 $\frac{5}{8}$-inch wrought-iron screw bolts to each ladder. All the carpenter's and joiner's work to hold the several scantlings and thicknesses named in the foregoing particular when finished. The carpenter and joiner to find all the materials, and the carriage thereof, and workmanship, and tools, and ironwork required for the completion of his work in the best and most substantial and workmanlike manner. All the timber to be free from shakes, or sap, or large knots. Wood bricks to be found where necessary; and also all fillets, linings, beads, stops, &c., where required. The girders and tie-beams to be each in one length, without joint or scarf.

1252. *Memorandum of Agreement* made this twenty-sixth day of April, 1831, between S. of G., Esquire, of the one part; and H. B. of G., Carpenter, of the other part:

viz.; In consideration of the sum of money, and the conditions hereinafter mentioned, the said H. B. doth hereby contract and agree to and with the said J. S., to perform the whole of the works described under the title of *Carpenter's and Joiner's Work*, in the foregoing particular, as the same are also exemplified in the plans, elevations, and sections, and details, which are identified by the signature of the parties hereto; and to complete the same in the best and most workmanlike manner, to the entire satisfaction of the surveyor appointed by the said J. S. to superintend the same, finding all materials, carriage, and workmanship of every kind soever, which may be required in the said works, for the sum of two hundred and forty seven pounds; and to complete the whole of the works as aforesaid, on or before the thirtieth day of July next ensuing the date hereof. And the said J. S. doth hereby agree to pay unto the said H. B., during the progress of the work, such sum or sums on account of the said sum of two hundred and forty-seven pounds as the surveyor may direct, provided such advance shall not exceed two thirds of the value of the work then done; and the remainder thereof on the thirtieth day of August next, provided that the said works are certified by the surveyor to be complete and finished according to the true intent and meaning of the foregoing particulars, the drawings referred to, and this agreement. And in case any difference or want of accordance shall appear between the drawings and the particulars, or any part thereof, the same shall be construed in the way most favourable to the substantiality of the work. And if any material shall be brought upon the premises which is disapproved by the surveyor, or any workman employed whose skill is considered insufficient by him, the said materials or workman to be removed or discharged immediately, upon the said H. B. receiving notice from the surveyor so to do. And in case any alteration shall be directed by the said J. S., or his surveyor, in the nature of the work, during progress, or any deviation shall be ordered by them from the foregoing particulars and plans aforesaid, the same shall not vitiate or annul this agreement; but the difference shall be valued by J. P. of G., Surveyor, between the parties, and shall be added to or deducted from the amount of the present contract (as the case may be), and his decision shall be final. And further, if any or all of the said work should be performed in any way inferior to the description and intention of the particulars and drawings, or shall be deteriorated below a fair standard of good quality or sound workmanship, the same shall also be valued by the said J. P. as aforesaid, and deducted from the amount of the contract by the said J. S., and his decision in this case shall also be final. Such parts of the work as affect or appertain to the machinery of the mill are to be done under the direction and to the satisfaction of W. B. of G., Engineer.

In witness whereof, I the undersigned have hereunto set my hand, the day and year before written. H. B.

Contract, £247.

1253. *Plumber's, Painter's, and Glazier's Work.* The ridge of the roof of the mill to be covered with cast lead, 7 pounds to the superficial foot, 18 inches wide, properly dressed, and nailed with lead-headed nails. All the sashes to be back puttied, and glazed with the best second Newcastle crown glass. All the sashes and frames, doors, shutters, and door frames to be properly primed, and painted three times inside and four times outside with the best white lead and oil colour, the doors and shutters lead colour.

1254. *Memorandum of Agreement* made this twenty-fifth day of April, 1831, between J. S. of G., Esquire, of the one part, and T. O. of G., Plumber, Painter, and Glazier, of the other part: viz.; In consideration of the sum of money and the conditions herein after mentioned, the said T. O. doth hereby contract and agree to and with the said J. S. to perform the whole of the works described under the title of *Plumber's, Painter's, and Glazier's Work*, in the foregoing particular, as the same are also exemplified in the plans, elevations, and sections, and details, which are identified by the signature of the parties hereto, and to complete the same in the best and most workmanlike manner, to the entire satisfaction of the surveyor appointed by the said J. S. to superintend the same, finding all materials, carriage, and workmanship of every kind soever, which may be required in the said works, for the sum of twenty-two pounds eight shillings and eightpence; and to complete the whole of the said works as aforesaid, on or before the thirtieth day of July next ensuing the date hereof. And the said J. S. doth hereby agree to pay unto the said T. O. the said sum of twenty-two pounds eight shillings and eightpence, provided that the said works are certified by the surveyor to be complete and finished, according to the true intent and meaning of the foregoing particulars, the drawings referred to, and this agreement. And in case any difference or want of accordance shall appear between the drawings and the particulars, or any part thereof, the same shall be construed in the way most favourable to the substantiality of the work. And if any material shall be brought upon the premises which is disapproved by the surveyor, or any workman employed whose skill is considered insufficient by him, the said materials or workman to be removed or discharged immediately upon the said T. O. receiving notice from the surveyor so to

do. And in case any alteration shall be directed by the said J. S., or his surveyor, in the nature of the work, during progress, or any deviation shall be ordered by them from the foregoing particular and plans aforesaid, the same shall not vitiate or annul this agreement, but the difference shall be valued by J. P. of G., Surveyor, between the parties, and shall be added to or deducted from the amount of the present contract (as the case may be), and his decision shall be final. And further, if any or all of the said work should be performed in any way inferior to the description and intention of the particulars and drawings, or shall be deteriorated below a fair standard of good quality or sound workmanship, the same shall also be valued by the said J. P. as aforesaid, and deducted from the amount of the contract by the said J. S., and his decision in this case shall also be final.

In witness whereof, I the undersigned have hereunto set my
Contract, £22: 8*s.*: 8*d.* hand, the day and year before written. T. O.

1255. *Remarks.* The foregoing mill was built as an auxiliary to a larger one close adjoining it; and, to make it complete as a district mill, another, viz., a dressing-floor, would be required to be added. The floors required in a complete mill are, the ground floor, the stone floor, the dressing-floor, the bin floor, and the stage floor in the roof.

Design II. — *The Construction of a Building for containing the Machinery and Apartments belonging to a Vertical Windmill, with Remarks on the different Kinds of Windmills.*

1256. *Windmills* are supposed to have been brought into France from the East in the sixth century. They are of two kinds, the vertical and horizontal; but the latter are rarely, if ever, used for commercial purposes, though they might sometimes be employed in gentlemen's grounds for raising water to supply the house, and other purposes, where the sails of the vertical windmill would be considered so unsightly as to render its erection inadmissible.

1257. *The Vertical Windmill* is the kind in most common use, and consists of an axis or wind-shaft, placed in the direction of the wind, and usually inclining a little upwards from the horizontal line. At one end of this, four long arms or yards are fixed perpendicularly to the axis, crossing each other at right angles; into these arms small cross bars are mortised at right angles, and other long bars are joined to them which are parallel to the length of the arms, so that the bars intersect each other in the manner of latticework; and form a surface on which a cloth can be spread to receive the action of the wind. These are called sails: they are in the form of a trapezium, and are usually nine yards long and two yards wide. The circular motion is produced by the obliquity of the planes of these surfaces from the plane in which all the four arms are situated. By these means, when the wind blows in the direction of the axis, it does not impinge upon the sails at right angles to the surfaces, but strikes obliquely: hence the effort of the sail to recede from the wind causes it to turn round the common axis, and the four sails are all made oblique in the same direction, so as to unite their efforts for the common object. For the wind to act with the greatest efficiency upon the sails, it is requisite for the wind-shaft to have the same direction as the wind; but as this direction is constantly changing, some apparatus is necessary for bringing the wind-shaft and sails into the proper position. This is done by turning the axis of the sails round in a horizontal direction. There are two methods of effecting this.

1258. *In the oldest windmills,* the whole of the building which contains the machinery is sustained upon a vertical post firmly fixed as a stand or foot, upon which the whole of the machine can be turned by a lever so as to present the sails to any quarter of the horizon whence the wind blows; and hence these are called post windmills, and are necessarily made of wood. They are of small size, and can only contain one pair of stones. The mill-house is of a rectangular form, but narrow in the direction which is presented to the wind. It is two stories high, the main shaft and millstones being in the upper chamber, while the lower is only used to contain sacks of flour, and to receive the post on which the mill turns round horizontally to face the wind. The whole building is turned by means of a lever, that also serves for a step-ladder into the upper chamber; and when it is wished to prevent the mill from turning, it is fastened to the posts by a cord. There is also a small windlass to assist in moving the mill round. These windmills are generally used for grinding corn or expressing oils; being unfit for other purposes, on account of there being so little room for machinery.

1259. *The other kind of vertical windmill* is called a smock, or tower, windmill, in which only the dome cap or head, which contains the axis of the sails, and covers the great cog-wheel, turns round horizontally; the other parts of the machinery being contained in a fixed building, which rises up in the form of a conical tower, and is composed of masonry, brick or timber framing; being surmounted by this movable cap or dome, which is supported on rollers, so as to turn round easily.

1260. *The Smock, or Tower, Mills* are considered the best, because the building which con-

tains the machinery may be made of any required dimensions, the sails and turning cap being all at the top of the house. Smock mills are built of timber, covered with boards; and tower mills are built wholly of brick or masonry. Fig. 1113 is a perspective view of

1113

a smock mill, as it appears with the sails spread to the wind. Fig. 1114 is a plan of the ground floor, showing the basement wall, which is of masonry, 20 inches thick, the cross wall for supporting the joists, and the story post, on the top of which rests the gudgeon pivot of the main axis or vertical shaft. This wall is of masonry, 14 inches thick; the joists are of oak 4 inches by 3 inches, and there is an oak sleeper on the cross wall 1 inch and a half thick and 4 inches wide. This floor is used for bolting and dressing the meal, and for filling the sacks with flour, &c. Fig. 1115 is a plan of the floor on which the mill-stones are placed, in which is shown the situations of the vertical shaft, *a*, the places of

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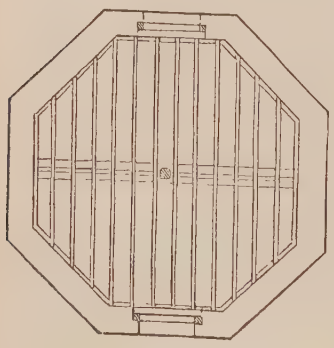

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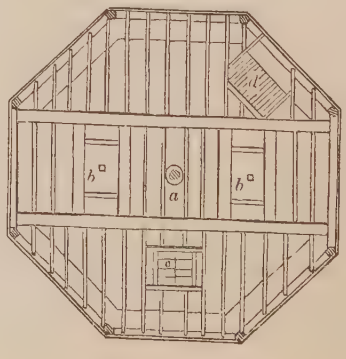

the two pair of stones, *b*, and of the sack-hole, *c*, for allowing the corn to be raised by the tackle into the bin floor. The trapdoors of the sack-hole fold upwards, so as to give passage-way to the rising sack, and they fall close down again directly after it has passed. There is a hole between the two flaps for the chain to hang through; and *d* is the step-ladder. The framing is of foreign fir; the plate is 6 inches by 7 inches; and the joists, 12 inches apart, and 6 inches by 2 inches, are mortised into girders 10 inches by 10 inches; as also are the trimming joists which support the stones, and are 8 inches by 9 inches. Fig. 1116 is a plan of the bin floor, on which the corn to be ground is kept for supplying the stones, for which purpose the bottom of the bins slope to a centre, where there is a wooden trunk passing downwards through the floor, to convey the corn to the stones. The dotted lines represent the sides of these bins, which are generally about 3 feet 6 inches high, and are formed of inch wrought deal boarding nailed on fir bearers. The plate is 6 inches by 6 inches, the girders 8 inches by 10 inches, with the joists 5 inches by 3 inches mortised into them; *e* is the sack-hole. Fig. 1117 is the upper floor to

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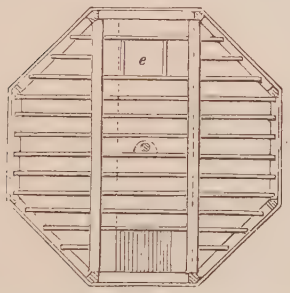

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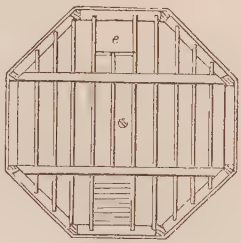
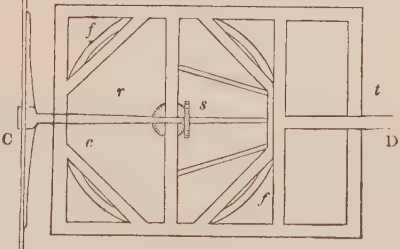


get at the machinery: the plate is 6 inches by 6 inches; the girders 9 inches by 8 inches; and the joists 4 inches by 3 inches. Fig. 1118 is a plan of the horizontal framework which carries the wind-shaft, and forms the base of the head or cap of the mill. The plates are 10 inches by 12 inches; the diagonal braces 7 inches by 6 inches; and the centre brace 10 inches by 8 inches. On the under side of this framing, and bolted to it, is a circular curb or wooden ring, *f*. There is a similar curb on the top of the fixed building. These curbs are to allow of moving round the head or cap; for it is necessary, as the wind changes its direction, to turn the sails about so that the axis or wind-shaft may be always in the direction of the wind. This motion is effected by turning the head of the mill round upon the fixed part on the curb at the top of the framing of the house of the mill, and is represented in section by *l*, in fig. 1119, between which and the movable curb, *m*, attached to the bottom of the frame of the head are fixed a number of rollers. The movable curb, *m*, of the cap lies upon these rollers, which are kept equidistant from each other by the centre-pins being fitted into a circular hoop. By these means, though the head of the mill with the wheels and sails weighs several tons, they can be made to turn round to face the wind by a slight force; *n* is the centre-brace of the head, turning on the pivot, *o*; *p*, the top of the vertical shaft on which, a short distance down, is a wheel called a trundle or lantern, which works into the cog-wheel on the wind-shaft, and so gives the rotatory motion to the shaft; *q* is one of the ribs of the head. In fig. 1118, the wind-shaft or horizontal axis, *r*, is made of cast iron, and is octagonal, thickest at the end next the sails, and having two cylindrical necks

1118



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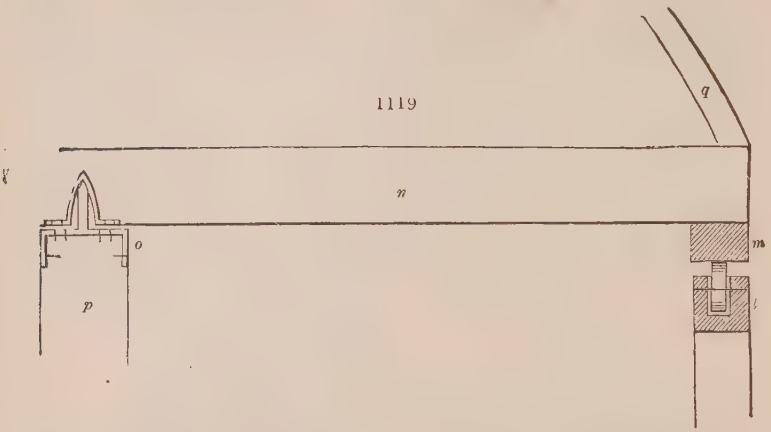

where it rests upon its bearings. It generally is placed a little inclined from the horizontal line; the highest end being towards the sails. At the end, it has a kind of box, which has two mortises through it in perpendicular directions to receive the sails. At the back of one of these mortises, and on the front of the other, a projecting arm is left in the casting to receive screw bolts which hold the sails fast in the mortises. The cog-wheel, *s*, is fixed on by bolting its arms against a flanch cast on the vertical axis; *t* is the commencement of a curved piece of timber 10 inches by 12 inches at top, and 6 inches by 6 inches at bottom, being the lever by which the heads of the old-fashioned mills are turned round to the wind. Attached to the lower end is a windlass, a cord from which fastened to any one of the posts that are fixed round the mill in a circle (see fig. 1113) enables a man to move the head in the direction desired. There are also two pieces of wood affixed to the bottom of the lever by staples, made sharp at the lower end, to stick in the ground, and to steady the mill against any side-gusts. There are several plans now in use for making the head turn itself when the wind varies: this is done by having small sails at the back of the head that do not revolve while the head is in its proper position, but as soon as the wind varies, these sails are set in motion, and by machinery bring the head again into its proper direction. This is considered a great improvement; but, as all the plans for this purpose involve much machinery, a detailed description of them is omitted, as they may be considered to come more under the control of the millwright than the Architect.

1120

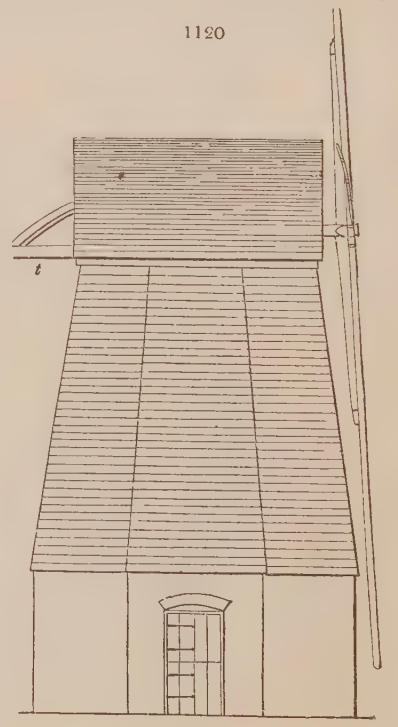

Fig. 1121 is a section across the roof, showing the framing of one end of the

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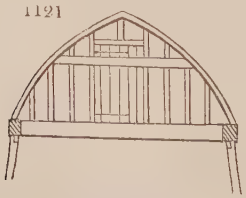
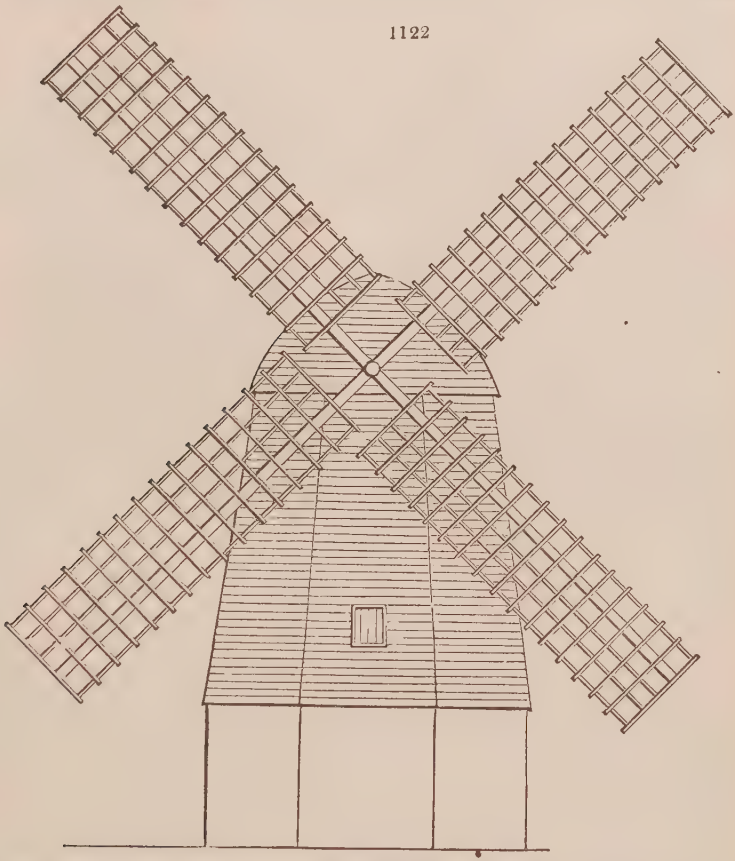


head, where there is a door that may be opened to give light when any repairs of the machinery are going on.

Fig. 1120 is an elevation of the east side of the structure, in which *t* is the commencement of the lever.

Fig. 1122 is an elevation of the north side, showing the front of the sails, the arms

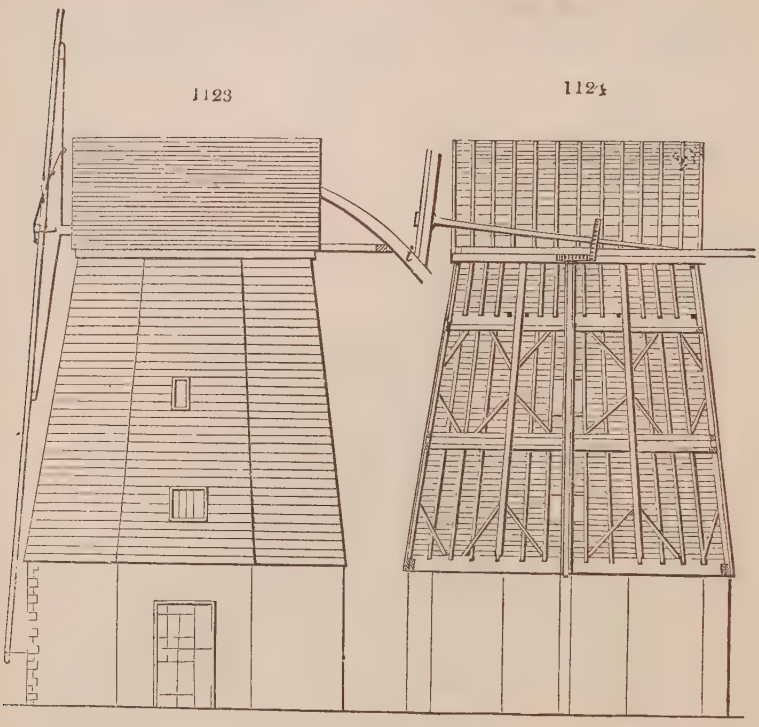
1122



of which pass through mortises in the end of the wind-shaft, and are bolted to projecting arms. The sails are clothed and unclothed by a line fastened to the upper corner of the canvass, passing over a pulley, and down the side of the arm to the bottom, where it is fastened. By these means, the canvass can be spread out at the end nearest the axis from below, in the same manner as a common window-curtain; the lower part is spread out by hand, and tied. When the mill is not at work, the canvass is gathered up in a roll over the arm. There are patent windmill sails now in use, in which a number of flaps or shutters of thin wood supply the place of canvass. They can all be moved from below, so as to present their edges to the wind when the mill is not at work. The computed power of a windmill, with four sails, measuring 66 feet French from the extremity of one sail to that of the opposite one, and 6 feet wide, or a little more, is, that it will raise 1000 French lbs. 218 feet in a minute, and is capable of working eight hours in a day upon an average. This is equivalent to the work of 84 men; 25 square feet of canvass performing about the daily work of one man.

Fig. 1123 is an elevation of the west side, in which *t* is the commencement of the lever, which serves for turning the sails to the wind.

Fig. 1124 is a transverse section of fig. 1118, from C to D, showing the framing of the mill. The corner or principal posts are 8 inches by 8 inches; the principal quarters and braces are 4 inches by 4 inches; and the common quarters are 4 inches by 3 inches. The clear height of the ground floor is 9 feet 8 inches; the clear height of the stone floor story is 7 feet 6 inches; that of the bin floor story 6 feet 8 inches; and



that of the upper story, to the under side of the frame of the head, is 4 feet 4 inches. The ribs of the roof are 4 inches by 3 inches, cut to a sweep. The roof is covered with 1¼-inch yellow deal feather-edge boarding, wrought on both sides, and the whole of the timber framing of the mill is likewise covered with 1½-inch yellow deal feather-edge boarding, wrought on both sides, and having a quirked bead forming a drip (see fig. 1125) run on the lower edge of each board.

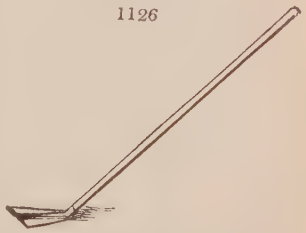
1125

1261. *Remarks.* This Design has been sent us by Mr. Varden, who has also compiled the preceding historical notice of the different kinds of windmills. We insert this Design, considering it extremely useful for new countries, where the inhabitants must necessarily be content to commence with simple machines. There are, however, windmills to be met with of a highly improved construction; and Mr. Thorold, who, being a Norfolk engineer, is well acquainted with the subject, informs us that, "in some parts of England, windmills are now brought to such perfection, as to be little inferior, in point of uniform motion, to either steam or water power. For grinding corn, threshing, draining land, or, in short, any operation, to perform which few hands are required; windmills are more economical than mills worked by either steam or water; and they may be rendered applicable to towns, by building the tower high enough to permit the lowest part of the sails to swing over the houses." Mr. Varden accompanied this Design by a scientific dissertation on the principles of windmills, which we have been obliged to leave out, not that we thought it irrelevant to the subject; but that its introduction would have extended this work beyond our proposed limits. We can only refer the reader to *Smeaton's Works*, *Brewster's Mechanics*, *Gregory's Mechanical Dictionary*, and the *Dictionnaire Technologique*. It is singular that there is not a single work on windmills in the English language; there are some remarks on gravitating sails by Heseldine, but no work embracing the whole subject.

Design III. — *A Malt-kiln, with the requisite Appendages, and Directions for their Use.*

1262. *Malting.* In order to understand the uses of a malt-kiln, and of the buildings and details generally connected with it, it will be advisable to commence by describing the process of malting; and this has been done to our hands by a correspondent at once scientific, and experienced in this important department of rural economy. "It is not very easy to give specific rules for the process of malting, because the practice of each year must vary with the temperature, and the quality of the barley. The experience of one year is no sure criterion for that of another; but there are general rules and broad principles that will apply to any season; and it is to these that I mean chiefly to confine myself in the following memoranda. — In the first place, the barley about to be malted should be of a plump kernel, dry, and well dressed. The policy of dressing well will be sufficiently obvious when we consider that the swimmings, or light grains that are skimmed off in the cistern, are generally worth but 9*d.* per bushel; and, to fetch even that, they must be sold immediately, because they will not keep; whereas, if taken out in a dry state by a winnowing-machine, they will sell for, perhaps, three or four times the sum, and will keep for any reasonable length of time. The water, or liquor as it is commonly called, is in general pumped to the required height in the cistern, before the barley is admitted: experience will determine this, but in Britain the present vexatious excise laws will insist that all the barley shall be covered, so that enough ought to be admitted to allow for the swelling of the barley during the process of steeping. It is not my present purpose to enter into all the minutiæ of the excise interference in this branch of business, but it is of such frequent occurrence as not to admit of being passed over, even in such a mere sketch of the process as the present one. The law, then, has determined forty-eight hours as the minimum period for steeping; the maltster may steep longer if he chooses; but first, I should have said, the barley is skreened, or dribbled into the steep, from a chamber above. Having lain the required time, the water is let off, and the barley is emptied into the couch, a square frame formed of battens, or deals, each, *by law*, two inches thick, and also, *by law*, not exceeding thirty inches in depth; here it remains, *by law*, twenty-six hours. The couch is then unloaded, and its contents laid into a tolerably thick bed. It may here be noticed, that a malt-house may have two, and sometimes three, working-floors: if two, then the corn steeped (which when it comes out of the couch is called the piece) is divided; one half being worked on the upper, and the remainder on the lower floor: or, if three, then the piece is equally shared by each floor, that is, provided the weather is not too warm; if it is, the upper floor must be either stopped altogether, or considerably 'curtailed of its fair proportion,' this floor of the building being usually the first to feel a change of temperature. It is quite impossible, after the barley leaves the couch, to lay down any fixed rules for the number of times a piece ought to be turned. This, and the thickness of the piece, must entirely depend on the state of the weather. If any sudden increase of temperature takes place (a circumstance of frequent occurrence, especially late in the season) not only must the piece be almost constantly kept turning, but the maltster will have to 'give it all the ground,' i. e. lay it as thin on the floor as he can. Besides actually turning, a piece is occasionally ploughed to lighten it up, and check the root. The plough is a light implement, constructed like fig. 1126, the whole being of wood, and about four or five feet long. Be the weather what it may, the maltster's eye must be almost always on his floors; on the one hand to check exuberant vegetation, by which the quality of his malt would be prematurely exhausted; and, on the other, to see that it is not injured by being untimely checked. There is a just medium in this matter, only to be insured by strict and unremitting attention on the part of both the master and his men.

1126



The root should not be long and straggling, like fig. 1127; but short and curly, like fig. 1128, bushy, and having a tendency to turn back. Yet even this checking should be done with judgment. If the piece be moved injudiciously often, or have too great a proportion of cold drying wind admitted into the house, the root will turn rusty, die away, and vegetation will be difficult, if not impossible, to restore. The main object of the maltster is to obtain the greatest quantum of saccharine matter from the barley; and this is found to be best

1127 1128

attained by 'getting the back well up,' as it is technically termed; that is, by forcing and encouraging the seminal shoot, or acrospire, as it is called, till it is nearly fit to start through the skin, not actually to show itself; but only the protuberance occasioned by its progress under the skin. To effect this is the great art in malting; and it requires from ten to fourteen days to accomplish it, after the barley has left the couch. Some maltsters are in the habit of loading the kiln before the acrospire is fully up, and of getting it up by means of a slow fire, and, of course, very gradual drying. I see no advantage in this; preferring the getting it well up in the back, before loading the kiln, and then of drying it off in half the quantity, and about half the time, say forty-eight hours. During the operation of drying, the malt should be turned three or four times, or one part would get more fire than it ought, while another would perhaps, be raw. An equality in the drying process is essential to the manufacture of good malt. I do not stop to describe the different sorts of malt; pale, amber, high-dried, &c.: the maltster ascertains the quality he wishes to make, and gives it more or less fire, according to circumstances. The quantum of fire is ascertained by chewing it till reduced to pulp (using as little saliva as possible), and then examining it between the thumb and finger; or, in default of that necessary article, good teeth, a small mill, somewhat like a pestle and mortar, only made of bone or hard wood, is frequently resorted to by way of substitute. Malt, when once well dried, should be kept in a dry room, as close as possible, or it will soon get clung (withered), and lose its fire (its crispness).

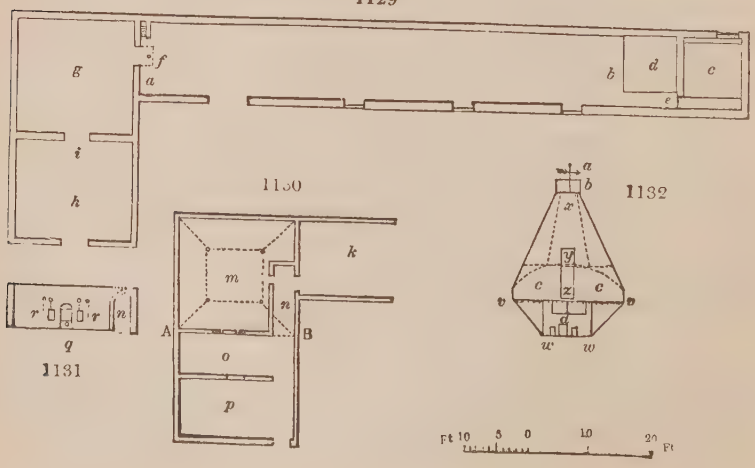
1263. "*The Malt-kiln*, to be hereafter described, is calculated to dry off a whole piece (say from 100 to 104 bushels) at once. The time required for this is about thirty-six hours; sometimes (as, for instance, in close foggy weather) a few hours longer. The fuel may be either coke or stone-coal; perhaps a mixture of each may be better, say two thirds of the former (by measure) to one third of the latter." Our contributor next describes, in succession, the upper working-floor, the lower working-floor, the kiln, and the furnace.

1264. *The Upper Working-Floor* is shown in fig. 1129, from *a* to *b*, 81 feet long, and 10 feet 6 inches wide; *c* is the cistern, 8 feet 4 inches long, 9 feet wide, and 2 feet 4 inches deep, in one corner of which there may be a plug to let off the water, and close to the outside of which may be a pump for supplying water; *d* is the couch, of the same dimensions as the cistern; *e*, a trapdoor, through which a part, generally one half, of the quantity steeped, is thrown from the couch down to the lower working-floor. There is another trapdoor at *f*, up which the contents of the lower floor are brought when sufficiently worked, in order to be put on the kiln. Over the upper working-floor there is, or ought to be, a floor or chamber for a stock of barley, which may be hoisted up to it with a crane, and there is a spout in the floor, to let it down into the cistern.

1265. *The Kiln and Malt-Chamber.* The kiln, fig. 1129 *g*, is 17 feet square; it is connected with the malt-chamber, *h*, by the door, *i*. Into this chamber the malt is thrown after being dried. There is another malt-chamber over this, the opening to which is shown at *y*, in fig. 1132.

1266. *The Lower Working-Floor*, fig. 1130, *k*, as it includes, in addition to the length of the upper floor, the length of the cistern and the couch, is about 100 feet long by 10

1129



eet 6 inches in width. In this figure, *m* shows the dunge (supposed to be a corruption of dungeon, from its appearance when looked down to from the kiln floor) or space between the kiln floor and the furnace; *n* is a passage taken off the dunge, but which does not interfere with the furnace, as may be seen by the same letter *n*, fig. 1131, which is a section on the line A B; *o* is the space in front of the furnace-door, 6 feet wide; and *p* is a place for stowing fuel. In fig. 1131 are seen the furnace and ash-pit doors, *q*, and the two shutters of the draught-hole on each side of the furnace, *r*. These draught-holes are about 1 foot wide and 18 inches high; and the admission of air is regulated by plates of sheet iron, which slide in frames and are balanced by weights, as shown by fig. 1133; in which *s s* are the draught-hole covers; *t* the furnace-door, and *u* the ash-pit door, with its ventilator. Fig. 1132 is a section of the kiln, dunge, malt-chamber, and conical roof; in which are shown from *v* to *v* the ends of the iron joists on which the flooring is laid: they are sixteen in number, and are supported by stronger iron cross-beams or girders, let into the walls, and also by the upright iron posts *w w*, 5 feet high, the situations of which are shown by *w w* in fig. 1134.

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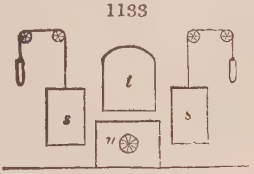

This section, and also the plan fig. 1130 show the diminution of the dunge from 17 feet to about 7 feet square. The cone is about 16 feet high from the floor *v v* to the top or kerb *x*; here the opening is two feet in diameter, which gives an area equal to that of the two draught-holes on each side of the furnace, and of the ventilator in the ash-pit door, agreeably to the principle laid down in § 798; *y* is the opening to the upper malt-chamber; and *z* the door to the lower malt-chamber. Over the opening at the summit of the cone there is a flat circular plate of iron, *a*, supported by rods, *b*, to protect the opening from the weather. The kiln floor is square at bottom; but at the height of 1 foot 6 inches at the angles it is gradually gathered into a circle, as shown by the dotted lines *c c*, in fig. 1132. It will be observed, that, while fig. 1131 exhibits a front view of the furnace with the two draught-holes, one on each side, fig. 1132 shows a back view of the same, with their openings into the dunge. The furnace-bars are 3 feet long. Over the mouths of the furnace and draught-holes is suspended from the floor-joists of the kiln a plate of iron 7 feet 6 inches long by 5 feet wide (*d* in fig. 1132, and *d d* in fig. 1134), which is called a dispenser, the use of which is to equalise the heat in the upper part of the dunge, so that the kiln floor, fig. 1134, *e e*, may receive it equally in every part. The furnace, *f*,

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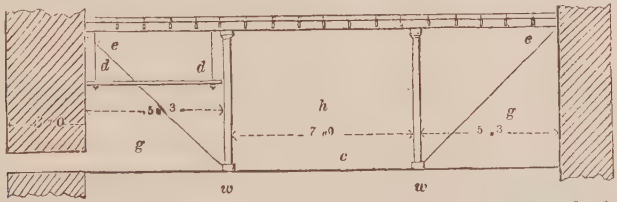

is 3 feet long; it is 18 inches wide, and 20 inches high, the ash-pit under it is of the same width, and 16 inches high; *g g* are the sloping sides of the dunge; and *h* the central part.

1267. *The Kiln Floor* may be either of tiles or of wirecloth; but the former are generally preferred. The under side of a kiln-tile presents a sort of honeycomb appearance, fig. 1135, *i*; but the upper surface on which the malt is laid is perforated with small holes, and has the appearance of *k*. A tile one foot square contains 120 large openings on the under side, with 8 smaller openings to each of the large ones on the upper side; thus giving a total of 960 apertures in every square foot. The openings of the small holes are larger on the lower than on the upper side, in order to prevent them from being choked with the malt dust or combs before mentioned. (See § 798.)

1135

1268. *Construction.* All the walls may be of brick or stone; the cone over the kiln floor should either be of brick, or, if economy be very much studied, it may be composed of a frame of iron rods hung over with plain tiles, and covered with cement. The bottom and sides of the couch may either be of wood, stone, slate, or of brick lined with cement. The malting-floors may be paved, tiled, or laid with composition. The furnace

may be built with fire-brick, and there should be a ventilator in the ash-pit door for regulating the draught of air through the fire. The dispenser may be of wrought iron, or of an iron frame filled in with large slates. The orifice at the summit of the kiln may be either protected by an iron plate, or by a tiled cover with sides of luffer-boarding. Other details have been given in the course of the description.

1269. *Remarks.* Various improvements have been attempted in malt-kilns of late years, and patents have been taken out for particular modes of construction; but of none of these have we been able to hear a favourable account. The most probable source of improvement appears to us to be the adoption of the circular form, and of the mode of heating by brick or iron flues, distributed through the dunge, in the manner practised by Mr. Read in his hop-kiln, to be hereafter described. Mr. Read, who has examined numerous malt-kilns in all parts of the country with a view to their improvement, informs us that he considers the plan adopted in his hop-kiln as equally applicable to a malt-kiln; but that he has found the proprietors of malt-kilns so strongly prejudiced in favour of existing forms, that he has never had an opportunity of trying the experiment.

Design IV.—*A Hop-oast, or Kiln for drying Hops.*

1270. *The Variations from other Kilns formerly required in a Kiln for drying Hops* will be exhibited in the following plans and sections, which have been obligingly sent us by our contributor, Mr. Varden. These figures from 1136 to 1148, Mr. Varden informs us, exhibit part of a range of building consisting of a repetition of similar parts situated at Farnham. The packing-house, fuel store, &c., are under the same roof. The six oasts are capable of drying at one time on the first haircloths, twenty-five bags of hops; each bag containing from sixteen to twenty bushels. These generally require twelve hours' drying before they are fit to be packed, unless they have previously been spread upon the upper haircloth, which is not often the case, except when there is a great quantity to be dried off in a short time. "The Design sent is that which I understand is generally considered to be the best. Some hop-growers, a short time ago, fitted up their kilns with a succession of drawers one above the other, having hair bottoms; but the extra-labour of these is found to be so great, that they intend removing them, and adopting the method about to be detailed. Fig. 1136 is a plan of the oast floor.

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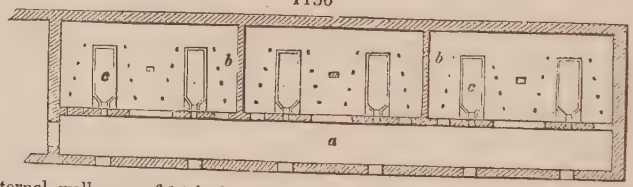

The external walls are of 14-inch stonework, the internal ones are brick; that against the passage *a* is 9 inches, and the two partitions, *b b*, are 4 inches and a half thick. The building is 53 feet 4 inches by 14 feet in the clear, and contains six oasts or kilns, *c*.

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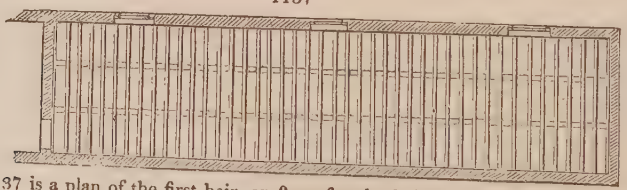

Fig. 1137 is a plan of the first hair, or floor for the haircloth, showing the timbers, &c. The joists are 3 inches and a half by 3 inches; the arris girder 5 inches by 5 inches,

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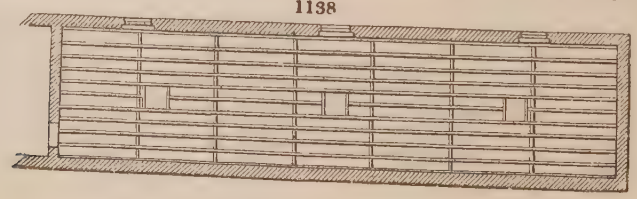

and the story-posts 5 inches by 4 inches and a half. Fig. 1138 is a plan of the second hair. The joists are 3 inches by 3 inches and a half; and the arris girders 5 inches by 5 inches. Fig. 1139 is an elevation of the front. The small windows have

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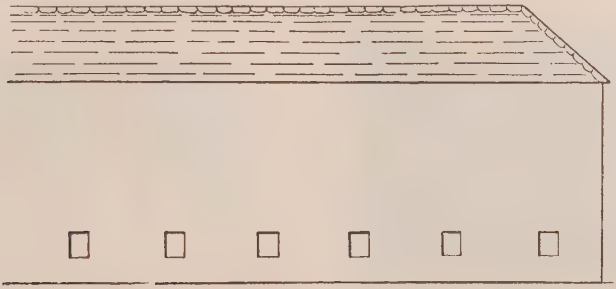

wooden shutters. Fig. 1140 is an elevation of the back. The windows are filled in with luffer-boarding. Fig. 1141 is a plan of a part of the building to a larger scale.

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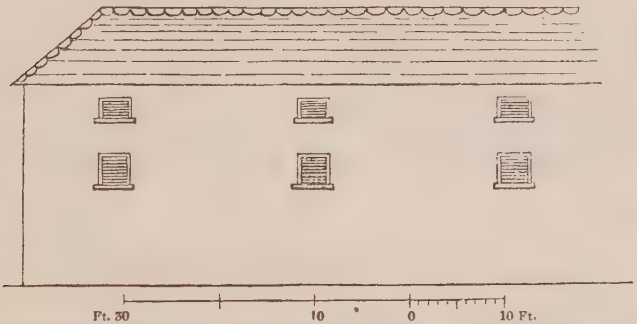

The pavement, *d*, is brick on edge covered with plain tiles; and the small square openings *e*, *e* represent the orifices of air flues; *f*, is the furnace. Fig. 1142 is a plan of a part of

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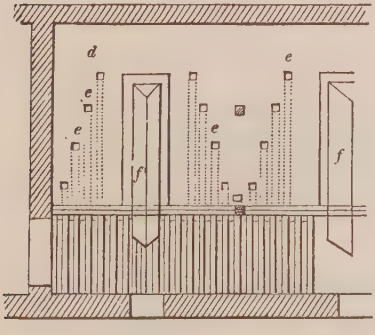

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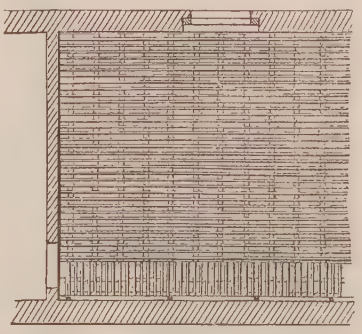

the first hair, showing the laths of which the floor is composed: they are 1 inch and a half by 1 inch, and 1 inch and a half apart. These open floors are used to allow of the warm air rising from below; and a large haircloth is spread over the whole, before the hops are laid out. Along the side, about 17 inches above the lathing, is a stage 20 inches wide for the men to walk upon without damaging the hops. This stage is made to fold up against the wall when not in use. Fig. 1143 shows part of the second hair. The arris girders are hung to the roof by wrought-iron rods, as shown in fig. 1145. Fig. 1144 is an elevation of a part of the wall at the mouth of the oasts, showing the fireplace *g*, ash-

hole *h*, and the mouths of the air flues, *i*, which latter have hinged flaps, *k*, to close occasionally. Fig. 1145 is a transverse section of the building; in which *a* is the passage shown by *a* in fig. 1136; *b* is the mass of pigeon-hole brickwork, which encloses the furnace shown by *c*, in fig. 1136, and by *f*, in fig. 1141; *c* is the brick floor, in which

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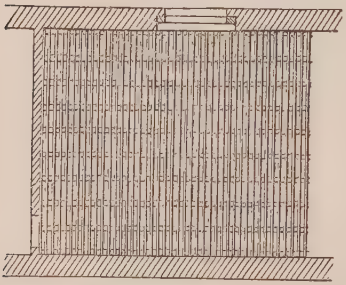

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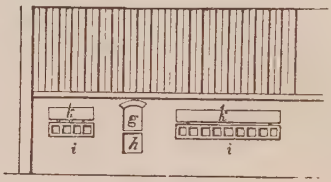

are the openings for the ascent of air, shown by *e*, in fig. 1141, and by the dots in fig. 1136; *d* is the lower hair, at it is locally termed, or lower drying floor; *e e* are the supports to the girders of this floor; *f* is a door of communication in the partition between the kilns; and *g* is the iron rod which supports the middle of the girders of the upper hair, or upper drying floor, *h*. The upper half of the roof is half tiled, to allow the steam to escape. When this method is adopted, cowls are not requisite. Fig. 1146, to a scale of 5 feet to an inch, is a plan of one of the oasts; in which *l* is the fireplace covered with a brick arch to the depth of 1 foot 8 inches. The fuel made use of is charcoal or culm (by culm is meant the charcoal from the smaller wood and sprays), and the fire is made on a cast-iron grating. No chimneys are required, the quantity of smoke being so very trifling. Fig. 1147 is a side elevation of the oast,

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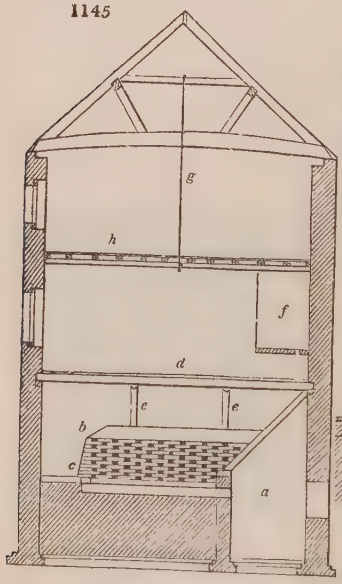

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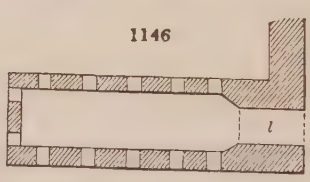

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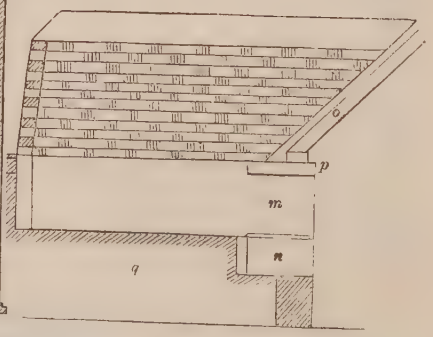

showing the open brickwork for letting out the warm air; the fireplace *m*, and the ash-hole, *n*. The timbers, *o*, are covered with two courses of plain tiles set in cement or mortar, and are 4 inches by 3 inches, and 4 inches apart. The fireplace arch is seen at *p*, and the soil under it at *q*. In the roof, the plate is 6 inches by 4 inches, the tie-beam 9 inches by 6 inches, the couplings 5 inches by 4 inches, the common rafters 4 inches by 2 inches and a half, and the struts 4 inches by 4 inches and a half."

1271. *Remarks.* This appears to be an expensive mode of drying hops, compared with that practised by many of the growers in Kent, who have adopted the improved circular kilns invented by Mr. Read, which will be next described.

Design V. — *A Hop-kiln or Oast, on an improved Principle, erected in* 1832, *at Teston, in Kent.*

1272. *Hops have been dried from time immemorial* on kilns with cockles, furnaces, or other fireplaces beneath them; the smoke and heated air being allowed to ascend through the hops, and to pass off by an opening in the apex of the roof, as in the case of the kilns for drying malt, corn, &c. About the year 1796, Mr. John Read, then a practical gardener at Horsemendean, in Kent (having had extensive experience in heating hot-houses by smoke flues, and having also tried steam in pineries so early as 1802), began to turn his attention to the subject of building hop-kilns. Mr. Read has subsequently invented his well-known improved garden syringe, his stomach pump, and various other surgical instruments of acknowledged importance; and it may easily be conceived that so ingenious a mind would improve any object to which he might turn his attention. The idea of applying flues like those of hot-houses to generate heated air, for the purpose of drying hops, very naturally occurred to him; and he soon found an opportunity of carrying his ideas into execution. Mr. Read has, since he began to erect hop-kilns on his plan, made various improvements in them; and he has furnished us with the Design about to be described, in which the whole are combined.

1273. *The object in view, in kiln-drying Hops,* is to discharge the water contained in the flowers. This, Mr. Read has ascertained to be, when the flowers are newly gathered, about 500 lbs. in every hundred bushels; and he finds that this moisture may be converted into vapour, by the expenditure of one bushel of common coals to every hundred-weight of hops, in twelve hours, the hops being spread on the floor of the kiln, in the proportion of one bushel to every square foot.

1274. *The Process of drying Hops* is as follows:—After being gathered from the bine, or stalk, the flowers are immediately carried in bags to the kiln, on which they are spread out to the thickness of from six to ten inches all over the surface of the kiln. The fire is then lighted, and kept burning briskly night and day, so long as there are any hops ready to be dried. It is found that a kiln of Mr. Read's construction may be charged once in every twelve hours. After the hops are dried, they are swept off the kiln into a cool well ventilated loft adjoining, and generally attached to it; this loft being formed over a cart-shed, or some other building open on one or on all sides. Being cooled here for a day or more, or according to convenience, the hops are bagged, or pocketed; the bag weighing two hundred-weight and a half, and the pocket one hundred-weight and a half; that is, packed in bags, which are suspended by a hoop from a round opening in the floor, and into each of which a man enters, to consolidate the hops by treading them down. When the bag is full, it is released from the hoop, and pulled up, still being retained over the hole, till it is beaten into shape, when it is sewn up, and let down into the shed, whence it is carried to market, or to the store loft, where it may be kept a year or more, if carefully excluded from the air. Hops dried on Mr. Read's kiln have been known to keep four or five years; but those dried by the common methods, and especially those of Farnham, seldom keep even twelve months, from the imperfect manner in which the process of drying has been performed. There are several excise regulations connected with the drying of hops in Britain, which we think it unnecessary to enter into in a work intended for both hemispheres; more especially as we anticipate the entire removal of the excise duties, and the substitution of a graduated per-centage or property tax for this and all other government taxes.

1275. *The Situation* of a hop-oast ought to be airy; and the external opening to it, for the admission of the air, ought to face that point of the compass from which the wind blows most frequently at that season of the year when hops are being dried. In England, the hop harvest is in the month of September, and the wind, in that month, is generally in the direction of the south-west. When several kilns are built together, and not in a straight line, but so as to form two rows or a group, as in the Design before us, this rule cannot be followed; but the next best rule is, to have the openings to the fireplaces facing the north-west and south-east, by which means they will catch a part of the current from the south-west as it passes.

1276. *The circular form* for the kiln has been adopted by Mr. Read, because it contains a greater area than any other figure with the same quantity of exterior walling; and because both the walls and roof can be made stronger than they can in any rectangular form, with fewer materials. Hence, while the circular kilns possess more strength and durability than the rectangular ones, the expense of construction is less.

1277. *Details of the Oasts* erected at Teston. Fig. 1148 is the ground plan; in which

a a are two kilns, twenty feet in diameter internally; and *b b* two other kilns, sixteen feet in diameter internally; *c* is an open space between the kilns, to which air is freely admitted by the openings to the south-east, south-west, and to the north-east, at *d d d*; *e*

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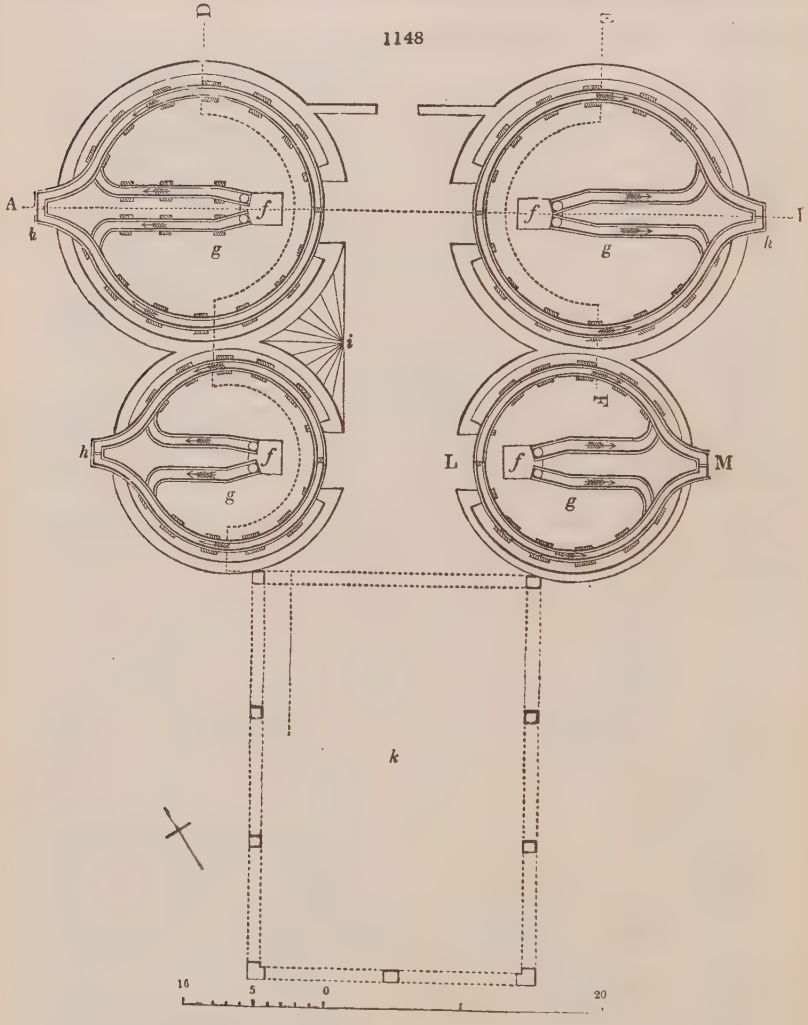

shows the openings to the dunge, and cockles or furnaces for the admission of air to the fire, and to be rarefied by the flues, previously to its ascending and passing through the drying-floor; *f*, the furnaces made of cast iron, with doors to the fuel-chambers and ash-pits of the same material; *g*, termination of a portion to the extent of one yard of the flues next the furnaces, which ought to be built of fire-brick, or which may be formed entirely of cast iron, as in this Design. The remaining part of the flues to be built of common brick on edge three courses deep, and covered with bricks or tiles, twelve inches long by six inches broad; *h*, the situation of the chimney shafts; *i*, the staircase for carrying up the hops to the drying-floor; and *k*, a cart-shed, over which is a floor on which the hops are cooled. Fig. 1149 is a transverse section on the line A B, or nearly so, in which *l* is the fuel-chamber, with the doors open; *m*, the thoroughfare between the two kilns; *n*, the flues; *o*, the chimney shafts; *p*, the drying-floor; *q*, the situation of the wall-plate; *r*, the doors to the drying-floor open; *s*, the floor of the loft, with the movable

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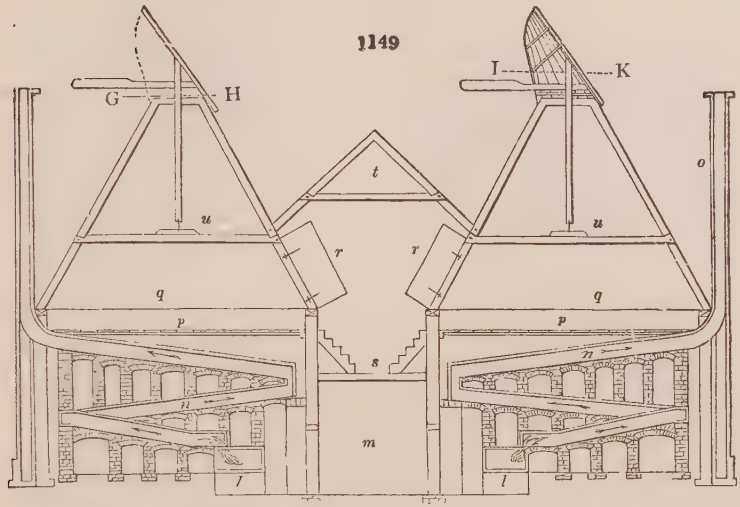

stairs to the drying-floor; *t*, the roof of the cooling-loft; and *u*, collar beams for supporting the spindle of the cowl. Fig. 1150 is a longitudinal section on the line C D, in which *v v* show the situation of the movable steps from the common floor of the passage loft, and cooling-room, to the double doors, *w*, of the drying-floor; *x*, bottom boards of the

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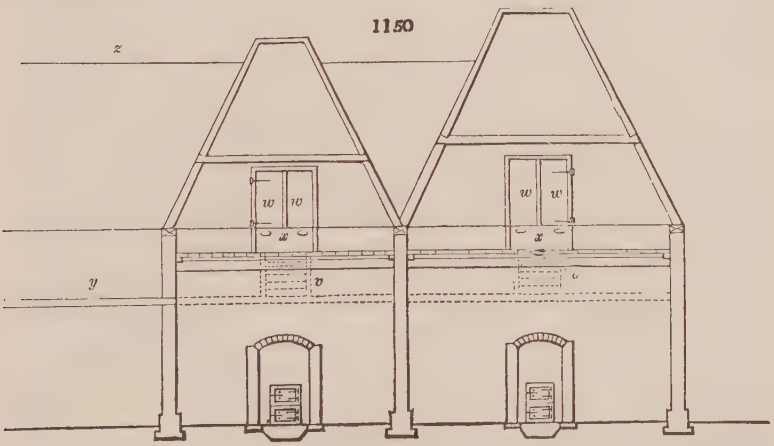

doors, eighteen inches deep, which fit into grooves, and have two holes in each for lifting them up every time the drying-floor is to be emptied. While this operation is going on, the step-ladders are removed, and the hops are swept through the door, and fall down into the passage loft, whence they are swept along to the cooling-chamber; *z* is the ridge of the roof from the cooling-chamber and passage loft. Fig. 1151 is a cross section of one of the larger kilns on the line E F, for the purpose of showing the returns of the flues, from the centre to the sides in the lower part of the dunge, and from the sides to the chimney shaft in the upper part of the dunge. Fig. 1152 is a dissected plan of the drying-floor, in which *a a* are the iron girders, the strength of which may either be such as to require no supports between the ends; or they may be so slight as to require one or more pillars as props between the extremities; when they are of cast iron, they may be in two lengths, four inches deep in the middle, and half an inch thick, each length of sixteen feet, supported by two iron columns: *b b* are

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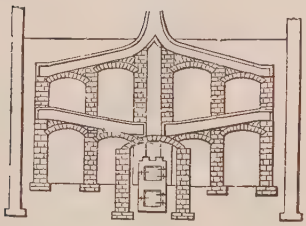

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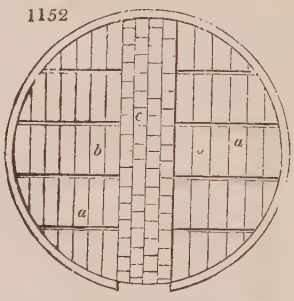

the laths, which may be either of cast or wrought iron; when of cast iron, they are four feet long, roach-bellied, that is, forming the segment of a circle on the under side, two inches broad at top, and a quarter of an inch on the under edge; when they are of wrought iron, they are one inch and a half broad (that breadth being necessary to form a bed for the tiles), and half an inch deep; in this case the extended length across the girders is from one of the kilns to the other: *c c* are the tiles pierced with holes, in the same manner as the tiles of malt-kilns, fig. 1135, § 1267.

1278. *Construction.* The exterior walls are of brick, with eighteen-inch footings, and are carried up a foot or more of the width of fourteen inches, after which their width is nine inches, up to the eaves of the roof, which are eighteen inches above the drying-floor. The rafters are four inches by two inches at the bottom; and three inches by one inch and a half at the top, where they abut against a circular curb or rim under the cowl. The furnaces or fuel-chambers are entirely of cast iron, and the ash-pits have iron doors. At the further extremity of the fuel-chamber there is an opening six inches square at top, through which the smoke and heat ascend into the flue. The flue for the first three or four feet is either built of fire brick, or formed entirely of cast iron six inches in diameter; after which its sides are formed of three bricks on edge, not plastered either outside or inside; and its top is covered with two courses of tiles, breaking joint, six inches by three inches. The reason why narrow tiles are chosen is, that duty is saved; and two courses breaking joint are employed, in order to prevent the risk of smoke getting through the joints into the dunge. The flues are supported by piers formed of open brickwork on edge, and joined by arches four inches in thickness, beveled on the top so as to form the base of the flue. Two flues proceed from each fireplace, ascending at an angle of 15°, or more if the height of the dunge will permit, in the direction indicated by the arrows, meeting at *e*, in the plan fig. 1148, and each there returning over itself, and again meeting at the chimney shaft, *h*. These flues may be easily cleaned by the removal, at short distances, of some of the covering-tiles; or, what is a much simpler mode, by burning in the fuel-chamber a few handfuls of dry brushwood, or dried hop-bine, or any thing that will quickly create such a draught as will carry all the soot in the course of a few minutes out at the chimney top. About London the washer-women clean the chimneys of their boilers on the same principle, by throwing in, in rapid succession, small quantities of gunpowder. The cowl should project about a foot on every side over the orifice in the summit. This orifice is, to that for the admission of air to the dunge, as one to one and a quarter. In the building of the walls of the kiln, in order to preserve them truly circular, an upright pole is fixed in the centre, and a guide-rod, fig. 1153, *d*, is framed on to it, of the requisite radius. The lower end of the central perpendicular pole is fixed in the ground, and the top kept steady by braces to other poles outside the circumference of the plan, so as not to interrupt the free revolution of the guide-rod. For every course of bricks laid on the wall, a course is also laid in mortar round the upright pole under the guide-rod, so that the latter is always kept level. So rapidly can bricks be laid in this manner, that Mr. Read finds such walling cost less than straight brickwork. The course of bricks immediately under the flooring tiles, twenty inches from the top, ought to project an inch inwards for the tiles to rest on. The exterior opening to the dunge should be kept low, it being found that

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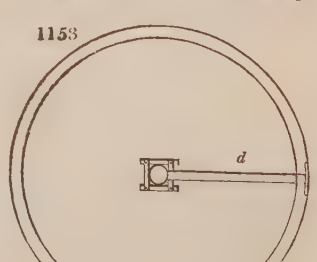

when this is the case the draught is always greatest; its height need never exceed four feet six inches, which is sufficiently high to admit a person to enter the dunge. When the manager of the furnace is once within, he immediately finds six feet of head room; there being a pier, *e*, nine inches by eighteen inches carried up on each side of the door, along with the outside wall, in as fig. 1154, which is a section on the line L M, for the purpose of forming abutments for the four-inch arch, *f*, which carries the double flue, the end of which, at the point where one returns on the other, is shown at *g*. The furnace and flues should be blackened exteriorly, in order to increase the radiation of heat, and the inside of the surrounding walls ought to be whitewashed, to prevent them as much as possible from absorbing it. The cowl moves altogether independently of the curb which forms the opening under it: it consists of one strong back piece, into which the upright spindle is framed, as may be seen in the section, fig. 1149, at I. Attached to the spindle and the back board is the fly-board, fig. 1155, *h*, which serves, like a rudder, to keep the back of the cowl to the wind. The boards forming the cowl overlap each other from the back piece, or rib, towards the sides; and they are nailed to iron hoops, as indicated in the section I K, fig. 1155, and also in the section, fig. 1149. In the former section, *h* is the fly-board; *i*, the back rib; *k*, the upright spindle; *l*, the iron hoop; and *m* the boarding. Fig. 1156, which is a section on the line G H, shows the manner in which the upright spindle works against a collar-piece, which is fixed across the centre of the curb, at the kiln top. This piece being fixed, and the collar containing the spindle bolted on to it, the bottom piece, in which the pivot of the spindle works, can, before it is fixed, be moved backwards and forwards on the collar beam till the spindle is brought to a perfectly upright position, and made to work freely.

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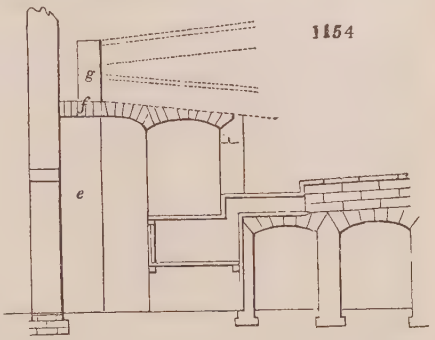

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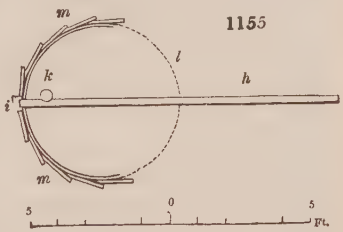

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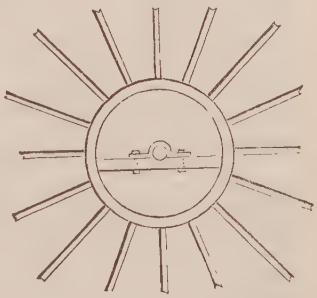

1279. *Estimate.* The expense of these four kilns, exclusive of the cooling-room, was about £700, which amounts to about 2½*d.* per cubic foot.

1280. *Remarks.* The great superiority of the circular kiln to that described in the preceding Design is so obvious, that we only wonder, considering it has been extensively used in Kent and Sussex for upwards of thirty years, that it has not found its way to Farnham. It must be obvious that not only any description of fuel may be used in Mr. Read's kilns, but that, from the great length of the flues, a much greater quantity of heat will be rendered available for passing through the drying-floor. The circumstance of the flues ascending at a considerable slope is highly favourable for promoting a draught, and consequently for thoroughly consuming the fuel. Mr. Read informs us that he has superintended the erection of some hundreds of these kilns; and that in one year he erected seventy, all within the counties of Kent and Sussex. This being the case, it strikes us with astonishment that Mr. Read's improvement has not been adopted by the hop-growers of either Farnham or Worcestershire, and the proprietors of malt-kilns every where. For our own part, we have no hesitation in saying, that we consider the malt kiln, Design III., though it be of the most improved construction, and the Farnham hop kiln, Design IV., though it comes from a district so celebrated for its hops, as discreditable to the science of this country. No man who understands Read's kiln would erect either.

Design VI. — *An improved Limekiln.*

1281. *Limestone is burnt* in a variety of ways. The object is, completely to deprive the stone of its carbonic acid gas with the smallest quantity of fuel, the least amount of labour, and in the shortest time. The rudest mode of burning lime is by mixing the stones with coal or other fuel, in large open heaps, and then setting fire to the coal or fuel. The first improvement on this mode consisted in covering up the heap with earth or turf, so as to confine the heat; a practice which, we are informed, is still followed in the islands of the West Indies. The next improvement was the forming of a well for burning the lime in the face of a bank, so that the stones and fuel could be thrown in at top, and drawn out, as burnt, at bottom. The ordinary form employed for this purpose is that of an inverted cone, or an egg with the broad end uppermost. The first improvement on this form was made by Booker of Dublin. The section of Booker's kiln forms two long narrow truncated cones, placed end to end, giving a width, or diameter, at the base and apex of three feet, and in the middle of seven feet. A suitable height for these dimensions is from twenty-five to thirty feet. On the top is a cast-iron cap or cover, which turns on a pivot, and rests on a curb-ring fixed on the top of the masonry of the kiln. The use of this cover is to prevent the escape of more heat than is necessary to keep the fuel burning, and, therefore, the opening at the top of the cap is a circle of not more than twelve inches in diameter. Very little heat is thus lost, and lime may be burned with as little fuel in winter as in summer. Another great advantage of this plan is, that by closing the orifice at the top of the cap and the furnace-doors below, the fire may be kept alive for four or five days, which, in situations where the demand for lime is not regular, is an object of some importance. Booker's limekiln has subsequently been materially improved by C. J. Stuart Menteath, Esq., the proprietor of extensive lime-works at Closeburn, in Dumfries-shire; and it is this kiln which constitutes our present Design. Booker's, and a variety of others, will be found described in our *Encyc. of Agr.*, 2d edit. § 3862.

1282. *The Closeburn Limekiln* is oval in the plan at top, and perpendicular in the sides to nearly half its depth; below which it is gradually contracted to the size of the grating of the furnace. The advantage of the oval form is, that the combustion is more regularly supplied with air than in the case of a kiln of large diameter. "Narrow kilns," Mr. Menteath finds, "also burn much faster, admit of there being drawn out of them every day (if fully employed) more than two thirds, or nearly three fourths, of what they contain of well-burnt line; and afford fully three measures of calcined lime for one measure of coal, when large circular kilns will not give out one half of their contents every day, and require nearly one measure of coal for two measures of lime burnt." In a country sale of lime, Mr. Menteath remarks, "the quantity sold every day is liable to great fluctuations: two or three cart-loads will sometimes only be required from an establishment which the day before supplied forty; and, as lime is known to be a commodity which, when exposed to the action of the air, becomes more bulky and heavy, and in that state does not admit of being carried to a distance without additional labour, it has been an object of importance with me, to find out a construction of a kiln which will allow of lime being kept for several days without slaking, and, at the same time, to prevent the fire escaping at the top of the kiln, if the kiln stands twenty-four hours without being employed, especially during the autumn and winter, when the air is cold, and the nights long. I now employ kilns of an egg-shape, and also oval. The oval-shaped kilns are divided by arches across the kiln, descending four feet from the top. The object of the arches across the kilns is to prevent the sides of the kilns from falling in or contracting, and also for the purpose of forming circular openings for feeding in the stone and coal at the mouth of the kiln. Upon this plan, a kiln of any length might be constructed with numerous round mouths." Having placed a lid to the cover of Booker's iron cap, Mr. Menteath is enabled "to prevent the escape of heat at the top, and by cast-iron doors at the bottom the air is prevented from passing through the kiln; so that by these precautions the limeburner can regulate the heat, and prevent its escape for several days; when without them the fire, in winter, would be extinguished in the course of twenty-four hours. This is an object of great importance, as it enables one to burn lime as well, and with as small a quantity of fuel, in the winter as in the summer season; and to supply the farmer with well-burned lime at any time of the year: an object which cannot be obtained by the common construction of kilns, open both at top and bottom, for the reasons before stated."

1283. *Burning Lime with Coke instead of Coal.* "From the great expense attending the carting of fuel from a distance of twenty-five miles from my own coal-pits, I have adopted the practice of coking the coal, which is a saving of eight twentieths of the weight; and I find that equal measures of coal and coke give the same quantity of heat in burning lime; which appears paradoxical, but is not the less true. The coal

is found to have little effect upon the stone till it is deprived of its bitumen, or is coked in the kiln; for, during the time the smoke is emitted from the top of a limekiln, little or no heat is evolved; or, in other words, the smoke carries off the heat, which is not given out from the smoke till it is inflamed; a circumstance which does not take place in the ordinary limekilns. When coke is employed for burning lime during the day, small coal should be used in the evening; in order to prevent, as much as possible, the escape or waste of heat during the night, from the rapid circulation of air through the limestone in the kiln. A kiln in which coke is the fuel employed will yield nearly a third more calcined lime (or shells, as they are termed in Scotland) in a given time, than one in which coal is the fuel. Coke may, therefore, be used occasionally, when a greater quantity of lime is required in a certain time than usual. It is well known to lime-burners that the process of burning is done most economically when the kiln is in full action, so as almost constantly to have a column of fire from the bottom to the top of the kiln, with as short intervals as possible in working the kiln."

1284. *Regulating the admission of air to the bottom of the kiln.* Mr. Menteath has found that limestone is apt to be vitrified during the process of calcination in stormy weather. This proceeds from the increased circulation of air through the kiln, which, by increasing the rapidity of the combustion, evolves in any given time a greater quantity of heat from the fuel employed. From having experienced the bad effects of too great a circulation without properly providing against it, Mr. Menteath considers it desirable to have it in his power to throw at pleasure an additional quantity of air into the bottom of the limekiln; both for the purpose of saving fuel, and, when the limestone is burned, to cool it, that it may be the sooner ready to be drawn out of the kiln. It is well known that, with kilns as they are commonly constructed, it requires nearly twenty-four hours to cool the limestone in the bottom of the kiln to such a degree as to prevent its burning the wooden carts in which it is to be carried away. (*Highland Society's Transactions*, vol. viii. p. 131.) The power of throwing in an additional quantity of air at the bottom of the kiln is easily attained by increasing the length of the bottom, and by having two or more furnace doors opening to it, instead of one.

1285. *The proportion of coal to limestone* will vary according to the softness, hardness, or density of the stone, and the strength and size of the pieces of the coal used. The same weight of coal will burn a greater quantity of lime, when in pieces of from half a pound's to a pound's weight each, than when in fragments of from half an ounce to an ounce. Hence those who employ small coal in burning lime, from its cheapness, are often performing the operations at greater expense than those who employ larger, and consequently dearer, coal. In working a kiln with narrow circular mouths, such as that about to be described; the stone and coal should be measured, in order to enable the workmen to proportion the one to the other. The stone and coal being in separate heaps at the top of the kiln, and both broken into small pieces, a fire is lighted on the iron bars at the bottom of the kiln. When this is fairly kindled, limestone and coal are dropped from the top in small quantities at a time, so as never to check the current of air through the fire. This operation is carried on till the kiln is filled, after which it is allowed to stand for several hours till a complete combustion of the fuel has taken place. If the calcined lime be wanted immediately, the furnace doors below are opened, and the cover at top removed, in order to produce a current of cold air through the kiln; if not wanted for some days, the top and bottom are closed to exclude the air, and to prevent the escape of heat. In Mr. Menteath's kilns there is a door both to the ash-pit and to the fuel-chamber over it. Through the upper door the calcined lime is drawn out; and through the under door are drawn out the lime ashes, which are a clear gain to the lime-burner where lime is sold by measure; because, if not separated from the larger pieces, they would only serve to fill up the interstices between the stones.

1286. *The situation* most suitable for building a limekiln is the face of a steep bank; but if this cannot be obtained, it may be built on a level surface, with a ramped road, or inclined plane, for carrying up the fuel and limestone to the top of the kiln; or, the sides of the building may be carried up perpendicularly, and the limestone and fuel hoisted to the top by means of a crane and windlass.

1287. *Details of the plans and sections.* Fig. 1157 is a section across a bank, on the face of which it is desired to build a limekiln. In this section, *a b c d* indicate the space to be occupied by the mass of masonry containing the kiln; and *c d e f*, the situation of the shed over the kiln mouth. Fig. 1158 is a ground or foundation-plan, in which may be seen, at *h*, the fuel chamber, two feet square, with iron bars laid across; two side openings for occasionally admitting an extensive quantity of air, *i i*, which openings may be blocked up with stones, to save the expense of iron doors; and *g h g*, the space in which the cart stands when loading with the burnt limestone, as drawn out of the kiln. Fig. 1159 is a horizontal section of the kiln at the height of eighteen feet from the grating of

the fuel chamber; that is, on the line A B, in fig. 1160. Fig. 1161 is a plan of the top of the kiln enclosed and covered by the kiln-shed. In this plan, *k k k* are the three circular openings in the covering arch of the kiln, through which the broken stones and coal are introduced: these openings may either be covered with a flat plate of cast-iron, or with one of Booker's cast-iron covers; this last is a truncated cone of cast-iron, the opening at the truncated part of the cone being a foot in diameter, with a lid to cover it occasionally; *l* is the place where the broken coal is laid down; and *m*, that where the broken stone is laid; a cart for bringing these materials into the kiln may pass in at one door and out at the other. Fig. 1160 is a longitudinal section of the kiln on the line E F, in which *n* is the side opening to the back of the fuel chamber; *o*, cast-iron covers (with openings in the centre, and lids over them) to the feeding apertures; and *p*, the springing of the covering arch. Fig. 1162 is a transverse section of the kiln and kiln-shed, on the line C D, in which is shown the ash-pit, under the fuel-chamber, *q*; the space between the double doors of the fuel chamber, *r*; the covered area on which the loading carts stand, *s*; and the cast-iron cover to the feeding aperture, and the protecting cover to the chimney of the kiln-shed, *u*. Fig. 1163 is a front elevation of the kiln, with the shed over it.

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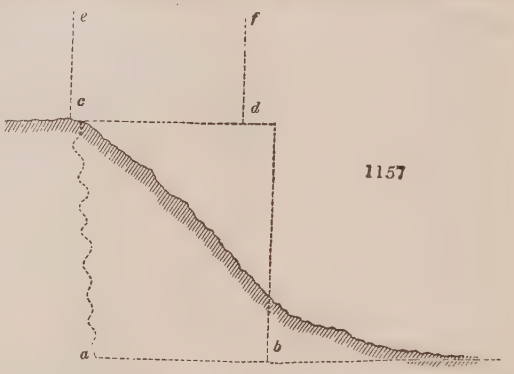

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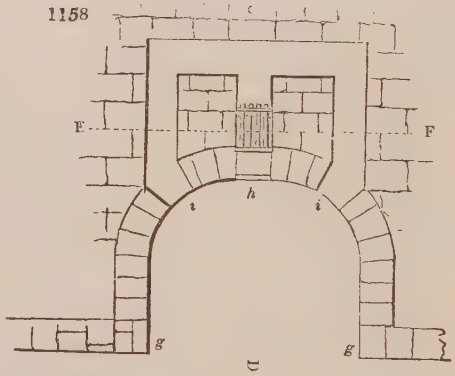

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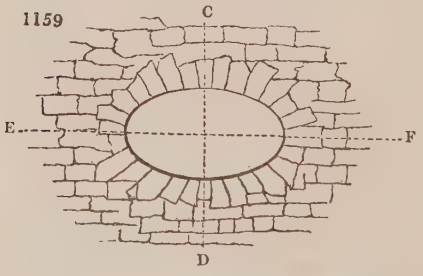

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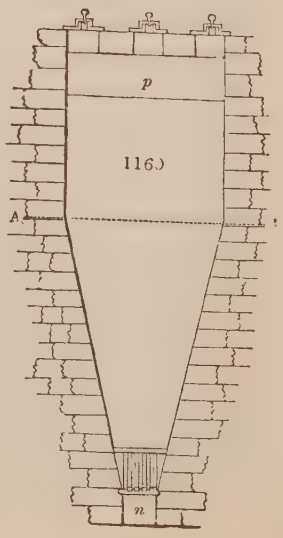

1288. *Construction.* The walls should either be built of fire-brick, or firestone; but they are sometimes built of limestone of the same quality as that to be burned within; but having the stones in large masses, so to prevent their being as much affected by the heat as the smaller stones in the kiln, which are mixed with fuel. The upper part of the kiln may either be arched over, or covered with cast-iron joists and flag-stones; leaving square or longitudinal holes for the admission of air, which

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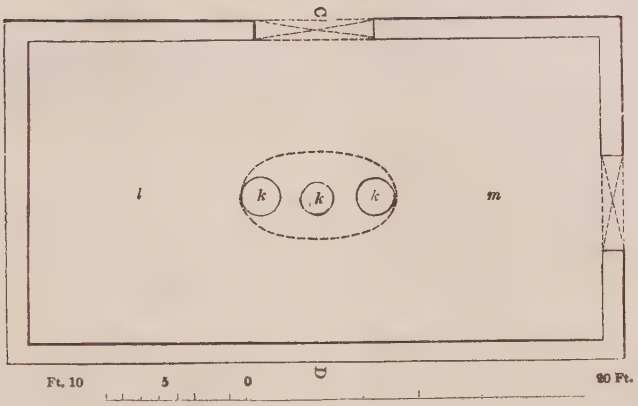

may be covered with a plate of cast-iron, regulated so as to give the exact degree of draught required. This contrivance will be found cheaper than the conical kilns of Booker; and, where there is a kiln-shed, it will answer equally well. When there is not a kiln-shed, Booker's covers are undoubtedly preferable; as they not only keep in the heat, but throw off the rain. The shed over the mouth of the kiln is of the greatest use in keeping dry the stones and fuel before they are thrown into the kiln; and not only keeping them dry, but heating them, and thus evaporating part of their moisture. These materials, therefore, ought always to be kept as near as possible to the feeding mouths; and when the heat of the kiln is to be continued for some time by closing both the bottom and top openings, the coal and unburnt limestone should be heaped up over the latter, in order that they may absorb as much as possible of the escaping heat. The double iron doors to the fuel chamber should be nine inches or a foot apart, to prevent the escape of heat; but single doors will suffice for the ash-pit below. The two side openings, for the admission of additional supplies of air at pleasure, may, when not wanted, be blocked up with stone, to save the expense of doors. The bars of the grating of the fuel-chamber may be two feet and a half long, two inches wide, and three inches deep, cast hollow; and the two cross bars

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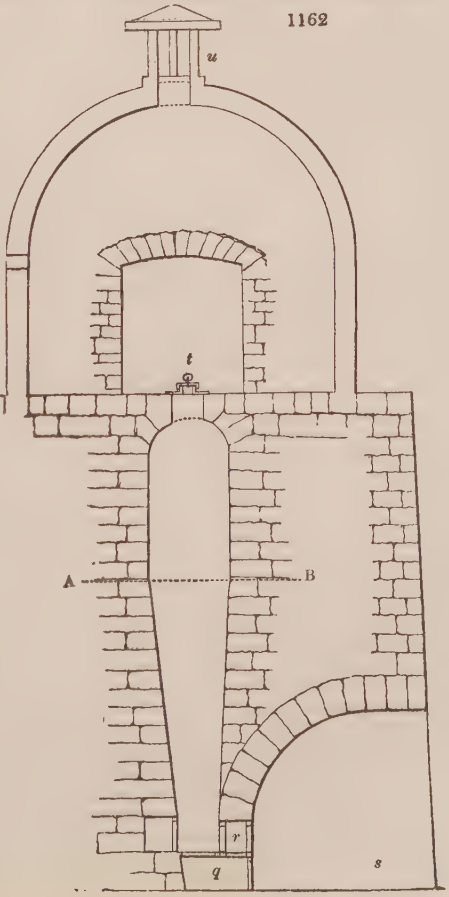
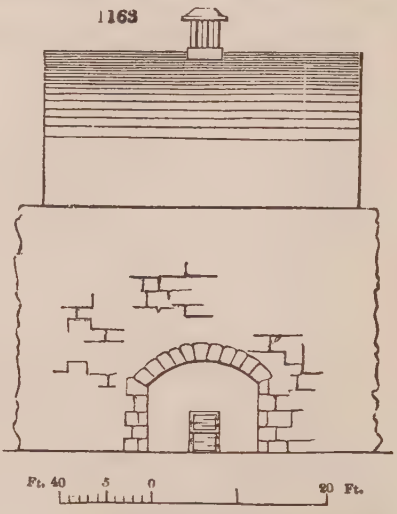


on which they rest may be three inches broad, and five inches deep, also cast hollow. The thickness of the metal, in either case, need not exceed a quarter of an inch; as the hollow in the centre, by admitting a current of air, keeps the bars cool, and prevents their decay. It is to be observed, that the opening behind the fuel-chamber, for the admission of an extra quantity of air, must have a grating where it enters the fuel-chamber, to prevent its being choked up by the lime while burning, or being drawn.



1289. *Remarks.* This Design for a limekiln we consider decidedly the best we have ever seen or heard of. We examined it, and several others of different kinds, at Closeburn, in 1831; we saw Heathorn's kiln in 1828, and we have seen, we believe, every variety of limekiln in use in Britain, having had occasion to build one for ourselves some years ago. We therefore consider that we are entitled to pronounce an opinion on Mr. Menteath's improvements. The same form of kiln is admirably adapted for burning clay, either to use as a manure, or to form walks or roads; and we shall presently show how it may be used for burning bricks. Heathorn's limekiln has for its object the preparation of coke as well as of quicklime. For this purpose, the kiln may either be a narrow vertical cylinder, with coking ovens placed around, and opening into it; or, it may be a long narrow kiln, like Menteath's, with a row of coke ovens on each side. The kiln is filled with broken limestone, and the process of burning is effected entirely by the combustion of the bituminous matter of the coal to be coked. A patent was taken out for this kiln some years ago; and one was erected at Maidstone, by the patentee, who has recently informed us that it continues to answer his expectations. Only one other kiln of the same kind, however, has been erected; which we conclude to be owing to the expense of building, and the greater time and care required to burn the lime in these kilns. Where lime is to be burned in small quantities, and where there is a great demand for coke, this description of kiln may perhaps be recommended; but the first cost, and the slowness of the operation of burning, are great drawbacks. This kiln will be found figured and described in our *Encyc. of Agric.* § 3868. It is evidently founded on the model of a perpetual limekiln, described by Count Rumford, in his sixth Essay, p. 181. The objects proposed to be attained by the perpetual kiln were, first, to cause the fuel to burn in such a manner as to consume the smoke, by obliging the latter to pass through the ignited fuel; and secondly, to cause the flame from the fire to come in contact with a large quantity of the broken limestone, so as to prevent the heat, as much as possible, from escaping into the atmosphere. The latter object was effected by making the kiln very high in proportion to its width; by filling it quite to the top with limestone; and by having the fireplace near the bottom of the kiln. The third object in view, was to render the process of burning lime perpetual, in order to prevent the waste of heat, which unavoidably attends the cooling of the kiln, in emptying and filling it. A fourth object was, so to arrange the process, as that the burnt limestone, while cooling, might give off its heat in such a manner as to assist in heating the fresh quantity of cold limestone with which the kiln was replenished, as often as a portion of burnt lime was taken out of it. To show how these purposes might be effected, Count Rumford had a model erected in the court-yard of the Dublin Society, and another in the farm of the English garden at Munich; and he has given an engraving and description of the latter in the Essay referred to. Whoever will take the trouble of examining it, will find that Heathorn's kiln only differs from that of Count Rumford in saving the coke; this object not being proposed by the Count. The fuel in both kilns is not mixed with the limestone, but is burned in a closed fireplace, which opens into the side of the kiln, at some distance from the bottom. For large kilns built on these principles, Rumford observes, there may be several fireplaces, all opening into the same cone; that shape of kiln being employed both by Count Rumford and Mr. Heathorn. At the bottom of Count Rumford's kiln there is a door, which is occasionally opened to take out the lime; and at the bottom of Heathorn's there are movable bars, which can be taken out, for the same

purpose. When a portion of the burnt lime is taken away either by Count Rumford's manner or Mr. Heathorn's, the empty space formed in the top of the kiln, by the subsidence which necessarily follows, is immediately filled with fresh limestone; and, when the opening at the bottom, through which the burnt lime is taken away, is closed, a very small aperture is left, to admit as much air as will create a draught through the hot limestone, now occupying the place of that which was removed, in order to carry up its heat to the limestone in the upper part of the kiln. This aperture in both kilns is furnished with a register. We observe by the *Dictionnaire Technologique*, and the article *Four à chaux*, in the *Cours Complet d'Agriculture*, that the perpetual kiln is recommended for France; but there is no evidence of any of them having been actually erected in that country. The form given as that now in general use in France is egg-shaped, with the upper orifice about two feet in diameter, and the lower one somewhat larger; because wood is burnt there on a hearth, and the calcination of the stone is effected by the flame passing through it, and not by the mixture of fuel with the limestone. In the turf and peat districts of France, these kinds of fuel are mixed with the stone to be burnt, in the same manner as it is commonly done in Britain.

Design VII. — *A Kiln for burning Bricks or Tiles, or other Earthenware used in the Construction of Buildings; and which may also be used as a Kiln for burning Lime or Clay for Manure, or coking Coal or Peat, or charring Wood, impregnating Timber with Pyrolignous Acid, kiln-drying Corn, or drying Corn in the Sheaf in wet Seasons, and for other agricultural Purposes.*

1290. *The Art of Brickmaking* was, probably, one of the first inventions of man after the art of agriculture; because houses and utensils are only second, in point of necessity, to food and clothing. Bricks may be formed in three ways: by compressing loamy soil, in an intermediate state between wet and dry, into convenient shapes of a rectangular form; by moulding moistened clay, and drying it in the sun; and by vitrifying these moulded forms by the application of fire. As the art of preparing the clay for making either bricks or tiles must be of great importance to the settlers in new countries, we shall, previously to describing a farm or country brick-kiln, give a short account of the manner of preparing the clay, and moulding it into bricks.

1291. *The Soil most suitable for making Bricks* is a clayey loam. The surface should be removed from it in the autumn, and the subsoil dug up, and mixed with about one sixth part of coal-ashes, during the winter; the whole being, during this season, exposed to the weather. In spring, it is turned over once or twice, and, after all risk is past from frost, the clay is prepared or worked, either by chopping and beating it, as dough is worked and kneaded by a baker, or by passing it through a mill, called a pug-mill, which effects the same object mechanically. The mass being sufficiently mixed and kneaded, it is laid on a table sprinkled with dry sand, from which it is taken in small portions, and pressed into moulds of the shape of the brick or tile which it is desired to form. These are first dried in the sun, or in the open air, under sheds, and afterwards burned in one or other of the modes which we are about to describe.

1292. *Clamp-kilns for burning Bricks* are nothing more than stacks or masses, composed of bricks, interspersed with layers of coal cinders. The first three or four layers or courses of bricks are placed on edge, diagonalwise, an inch or more asunder, and the superincumbent course breaking joint; the second, third, and fourth courses on edge over them are also placed diagonalwise, and so as to leave considerable interstices for being filled up with the cinders. Thus, the lower part of the clamp, or kiln, is formed of about three fourths of the cubic contents of imperfectly burned bricks, and one fourth of coal cinders in the interstices between them. The superincumbent part of the clamp is formed of new-moulded bricks set close together on edge, every layer having a stratum of half an inch of small ashes placed under it. The size of the kiln is without limit as to length and breadth; but it is found that the weight of more than fifteen or twenty courses of unburned bricks, laid one over the other, will crush or deform those at the bottom. In placing the lower stratum of four courses of open brickwork and cinders, there is a kind of horizontal tunnel, or channel, continued through the work upon the ground, about a foot broad, and eighteen inches high, which is filled with wood and coal, to serve as the means of lighting the cinders among the bricks on each side. When the contents of this tunnel are once thoroughly lighted, its ends are closed up with brick or clay. The stack or clamp is carried up in sections, or vertical strata, of between three and four feet in thickness; and when as many bricks are put together as it is desired to burn, the whole is surrounded by a double casing of refuse bricks, or such as are imperfectly formed, for the purpose of keeping in the heat, as well as of, to a certain extent, reburning them. A clamp-kiln generally continues burning twenty days, and is used for burning bricks only.

1293. *Covered Kilns for burning Bricks or Tiles* are very simple in their construction. Like limekilns, they may be formed either above the surface, or more or less under it. The objects are to generate an intense heat, to equalise it as much as possible over a given space, and to continue it in that space for a certain length of time. The form which we have already given for a limekiln would answer perfectly for a brick-kiln; provided arched ribs were thrown across it, at the height of ten feet one above another, in order to prevent the pile of unburned bricks from being crushed or deformed by their own weight. Where the situation admits, a brick-kiln will always be constructed on the most durable plan when the body of the kiln is sunk in a dry soil; because, in this case, the side walls may be much narrower, and also because the escape of heat by them will be much more difficult. A kiln to burn 20,000 bricks at a time need not have the chamber more than sixteen feet by fourteen feet, and eight feet high; above which, the sides may be gradually gathered in, so as to terminate, at the height of twenty or twenty-five feet, in an opening of two or three feet in diameter. The fire is supplied below the floor of the kiln; this floor being of open work, and at such a height above the fire as that the flames and heat may be equally diffused in their ascent through the openings in the floor. The fire is made in two or more furnaces, which generally extend the whole length of the kiln; and these furnaces are made larger or smaller, according as they are intended to burn coal or faggot wood. Those who are desirous of building a complete brick and tile kiln may consult *Ware's Architecture*, chapters xii. and xv., in which they will find the plan and description of one for burning 34,000 tiles; and, at the same time, about half as many bricks. We shall confine ourselves here to a kiln of a very small size, which will burn bricks, tiles, lime, or clay, at pleasure. It may also be used for coking coal, to be employed for chamber fires, or French cooking; for making charcoal of wood, or peat; and various other purposes. For example, when the kiln is employed in burning bricks, or charring wood or peat, a quantity of timber to be saturated with the pyrolignous acid of the smoke may be placed over the mouth of the kiln, under the tiled roof; and all the large openings in the latter closed. In wet seasons, corn in the sheaf may be placed under this roof; and coke, coal, or peat, burned below. By removing the arched top, and replacing it by a flat one, like that of a malt or hop kiln, it is evident that malt, hops, and corn, previously to being ground into meal; peas, before being split; or sliced potatoes, to be preserved; and other articles, may be dried, using coke or charcoal as the fuel.

1294. *Details of the Design.* The situation of this kiln is supposed to be similar to that of the limekilns, on the face of a steep bank; but it may be built on a level surface, of the same dimensions, surrounding the brickwork with two iron hoops. The walls of the ground plan are shown curved outwards; in which form they are found to expand and contract with less injury than when they are built straight. In the latter case, they contract to a concave line, and ultimately give way. Fig. 1164 is the ground plan; in which *a* shows the walls two feet thick; *b*, an outer wall of nine inches, with a vacuity of six inches between; *c* is the ash-pit, sixteen feet long, and two feet six inches wide; *d*, part of the iron bars laid over it, two inches deep, one inch broad, and half an inch apart: these bars are cast hollow, and laid loose; *e* is the opening or doorway over the furnace by which the kiln is charged with brick or other materials to be burned, after which the door is built up. Fig. 1165 is a dissected horizontal section from A to B in fig. 1167, in which *f* is part of the ash-pit; *g*, part of the grating; *h*, part of the bearing arches over the grating; *i*, the first layer of open brickwork on edge over the bearing arches; *k*, the second layer crossing the first, which

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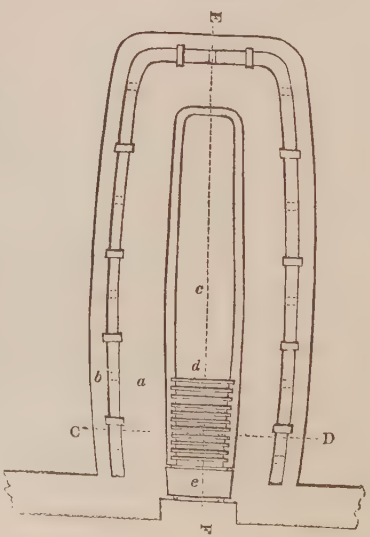

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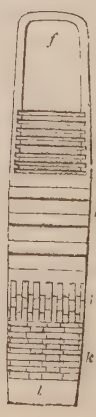

forms the floor of the kiln; and *l*, the sill of the door of the kiln. Fig. 1166 is a transverse section on the line C D, in which *m* is the ash-pit; *n*, the fuel-chamber; *o*, the bearing arches over it; *p*, the open brickwork, forming the floor of the kiln; *q*, double arches over the kiln mouth; there being in the lower arch six small openings on the sides for the escape of the smoke, and in the upper arch four larger openings along the top; the united areas of the openings in each arch being equal to the area of the ash-pit door; *r*, coverings of iron or stone to the upper openings, for use when it is desired to retain the heat in the kiln; *s*, roof covered with tiles for enclosing timber to be smoked, corn in the sheaf to be dried, &c., and for serving as a roof when the covering arches are taken off, and the kiln used as a malt or corn kiln; *t*, a vacuity between the inner and outer walls. Where the kiln is likely to be used alternately for burning bricks and lime, and for drying corn, instead of a fixed arch of masonry over the top, an arch may be built on a cast-iron frame placed on wheels, and

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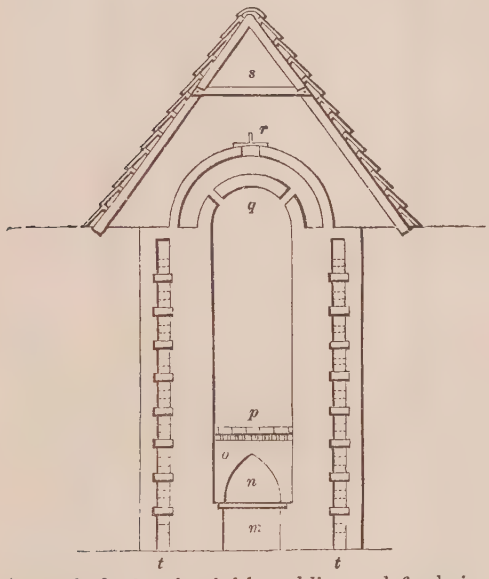

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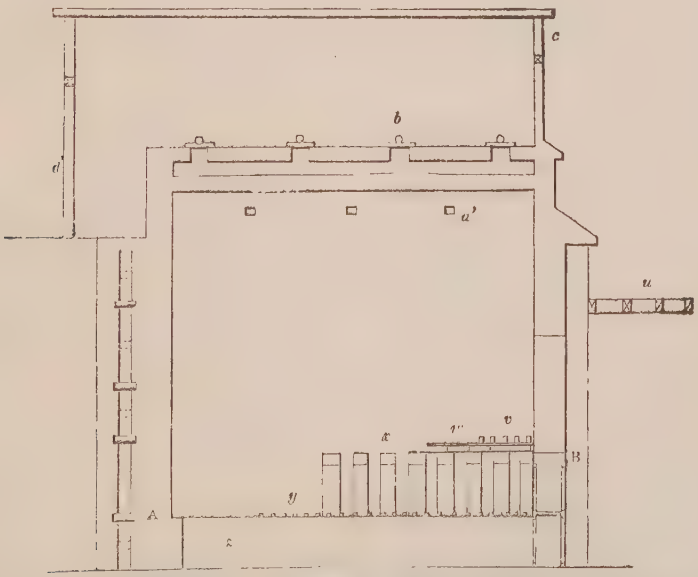

drawn off and on at pleasure by windlasses, as practised at Closeburn, and figured and described in the *Ency. of Agric.* 2d edit. § 3864. Fig. 1167 is a longitudinal section on the line E F, in which *u* is the roof of the fuel-shed, and the shed under which the moulded bricks are dried before being put in the kiln; *v*, the kiln floor; *w*, the open

brickwork under it; *x*, the bearing arches; *y*, the iron bars of the fuel-chamber; *z*, the ash-pit; *a'*, the openings in the under arch; *b'*, the openings with covers to the upper arch; *c'* a triangular opening in the upper part of one end for the escape of the smoke; and *d'*, an entrance door. Fig. 1168 is a ground plan of the fuel-shed, and the shed over the kiln, in which, *e'* is the fuel-shed on the lower level; *f'*, the upper arch of the kiln; *g'*, the under arch; *h'*, the kiln chamber, and *i'*, the door to the upper shed. Fig. 1169 is a section through the plan at G H, showing the roof and pillars of the fuel-shed, and the elevation of the wall of the kiln, and the end of the upper shed. In the lower part may be seen the furnace and ash-pit doors; above them the door to the kiln, *k'*; and in the end of the upper roof the opening for permitting the escape of smoke, *l*. In this elevation, as in those of all the preceding Designs of kilns, no attention has been paid to effect, and very little to architectural style; but every building may be made to have an appearance, expressive not only of architectural design, but even of some particular architectural character. This character may be derived from its use, its locality, or from historical allusion. For example, a brick-kiln may be built on the face of a bank, like that before us, with nothing more than simple architectural expression; that is, having the walls marked as such by the proper sizing, squaring, jointing, and laying in horizontal beds, of the stones composing them; or, by other means, in connection with these, by this time well known to the reader. Now, the expression of use may be given by a kiln chimney being made the leading feature; that of local connection and character by the same forms of arches, or other openings or prominent parts, being adopted, as those which are most striking in an adjoining bridge, or other public building; and historical allusion may be created by carrying up the kiln-shed as a castellated tower, or fragment of a ruin.

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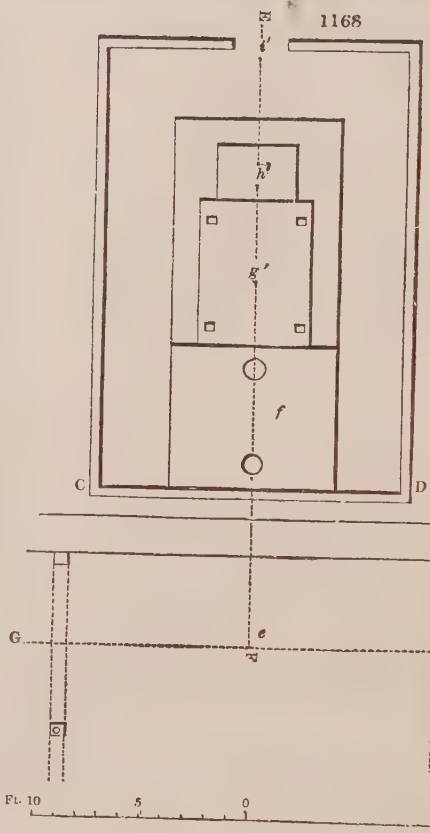

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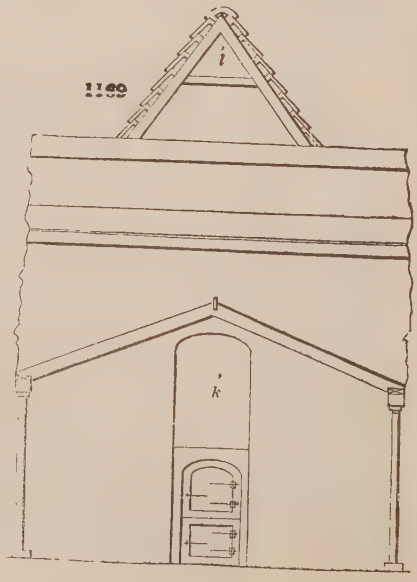

Design VIII. — *A Cider-house, Mill, and Press, according to the Plan most generally approved of in the Counties of Hereford and Worcester.*

1295. *The Cider-house* is shown in figs. 1170, 1171, and 1172. Fig. 1170 is the ground-plan, in which *a* is the entrance door, and *b* the door to a cellar, where a stone

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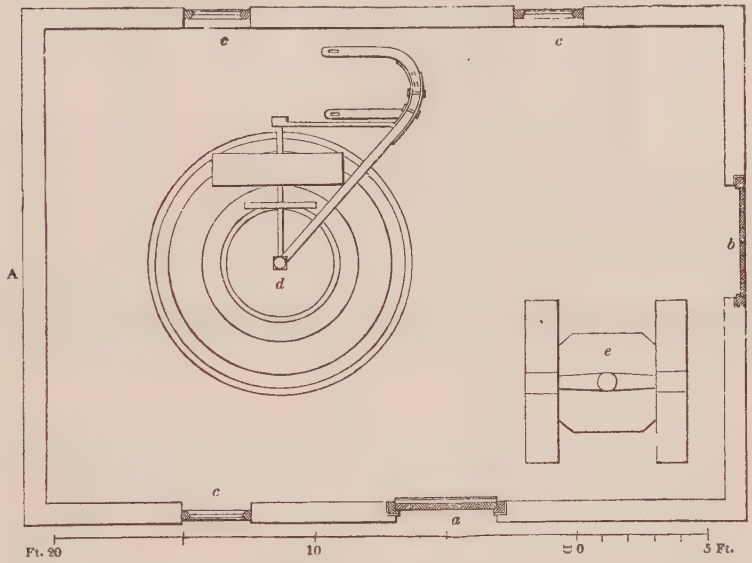

vat for receiving the liquor should be placed, having a trough from the lip of the press to it. There are three windows, *c c c*; the cider-mill, *d*, is placed in the centre of the house; and the press, *e*, at one corner near the door to the vat cellar. Fig. 1171 is a longi-

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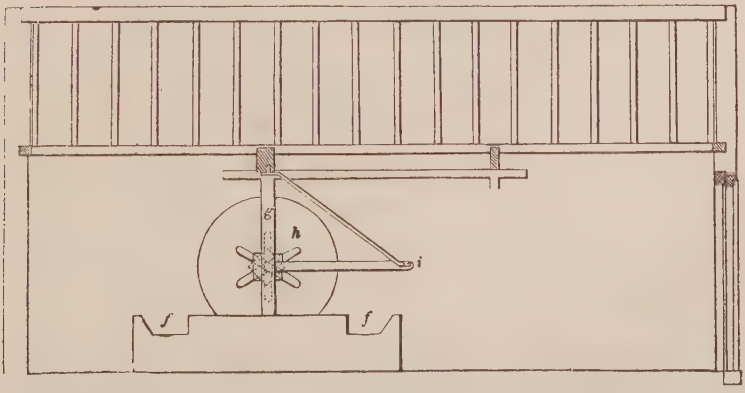

tudinal section through the centre of the building, in which may be seen the cider-mill, with its stone trough, *f*; upright shaft, *g*; grinding wheel, *h*; and horse-shaft, *i*. Fig. 1172 is a cross section on the line C D; in which are seen the cider-press, *k*; the door to the vat-cellar, *i*; and the window, *m*.

1296. *The Cider-Mill* is shown in the plan, fig. 1173, and in the sections on the line

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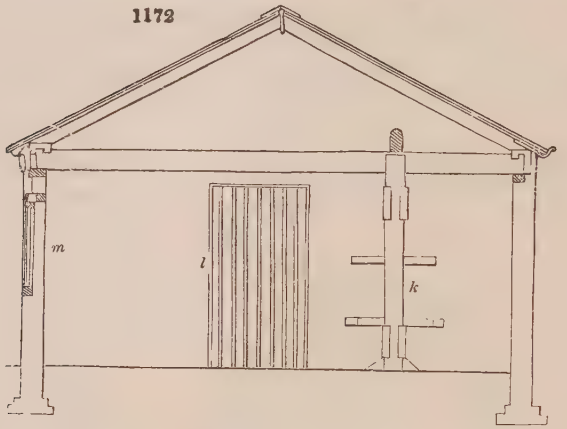

A B, fig. 1174, and on the line C D, fig. 1175. In each of these figures, the same letters represent the same parts: *a* represents an upright shaft or spindle four inches and

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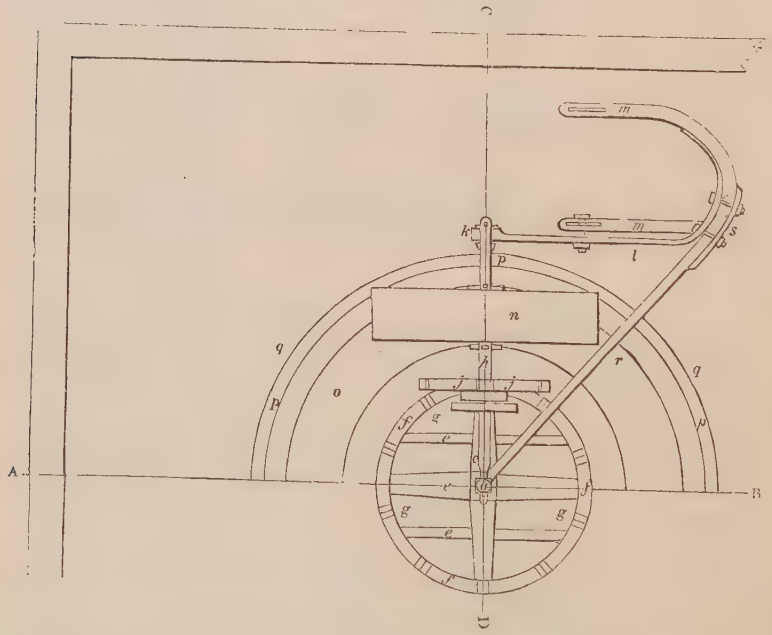

a half in diameter, with an iron band and gudgeon on each end; the top one working on an iron plate with a hinge joint and staple to release the spindle. The bottom gudgeon is shouldered, to prevent it going too far up the shaft, and it works in a cast-iron cap, *b*; fixed to the cross-piece or arm, *c*, which is bedded in the stonework, *d*. There are three other arms, *e*, halved on *c*, at right angles to it, for the purpose of securing the circular him, *f*, to which the cogs or teeth, *g*, are fixed. There is an axle or spindle, *h*, one end of which works in the upright shaft, *a*, and which is compelled to revolve on its own axis, when taken round with the spindle, by means of the spokes, *j*, which work in between

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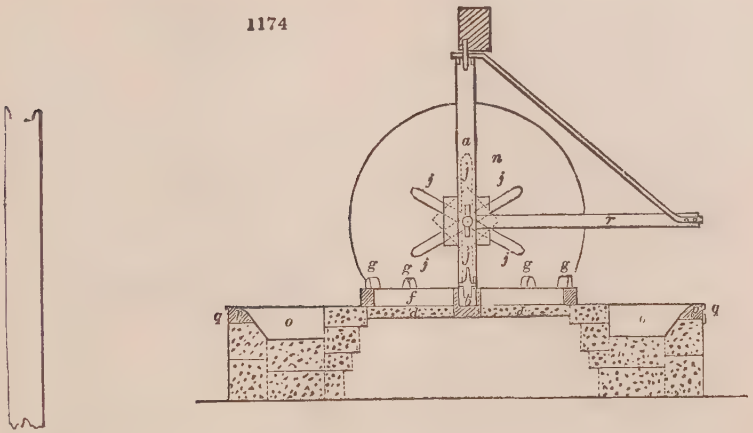

the cogs or teeth, *g*; the other end works in an iron collar, *k*, which is attached by means of the iron bar, *l*, to the horse-shaft, *m*, so that the power of the horse, when

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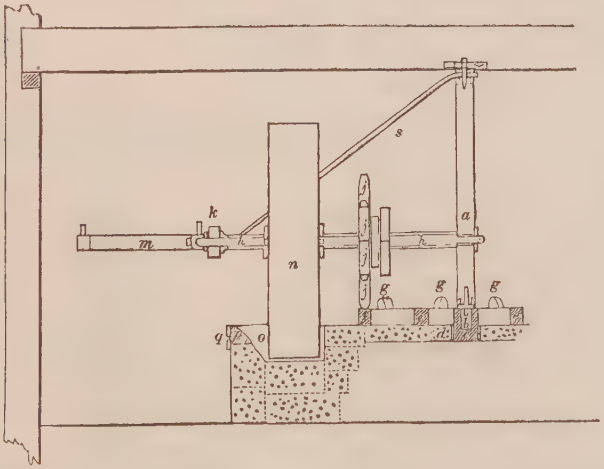

applied, causes the axle, *h*, which has a millstone, *n*, fastened on it, to revolve in the circular channel, *o*; into which the fruit intended to be ground is put. The channel and millstone must both be of siliceous or grit stone; and the former must be guarded by the oaken curb, *p*; and by two bands of strong hoop iron around the periphery of the mill at *q*. The pole, *r*, is a piece of oak three inches square, fastened to the upright shaft, *a*, and to the horse-shaft, *m*; and from the top of the upright shaft, *a*, there is an iron bar, *s*, for the purpose of supporting the pole near its junction with the horse-shaft, *m*.

1297. *The Cider-Press* is shown in figs. 1176 to 1179, in which the same letters represent the same parts. Fig. 1178 is a plan of the press; fig. 1176 is a section on the line A B, in fig. 1178. Fig. 1177 is a section on the line C D; and fig. 1179 is an isometrical view. The letter *a* represents the oak sill 6 feet long, 14 inches by 7 inches, the top of which is level with the ground; to this sill, the upright, *b*, 14 inches by 9 inches, is framed and pinned, the angles being further secured by 4 pieces, *c*, nailed to both; *d* is a piece of oak 14 inches by 12 inches, framed to the upright, *b*, for the purpose of supporting the bed of the press, *e*, which is of oak, 3 inches thick, doweled together,

3 feet 9 inches wide, and the same in length, with the angles canted off. (Dowels, in timberwork, are pins, or tenons, generally of oak, which are let into two pieces intended to be joined in their interior, so as not to be seen externally: it differs from the mortise and tenon, in the tenon or dowel being a separate piece from the two which it connects. In fig. 1180, *a a* are round oak pins for dowelling two fir planks together, and *b b* two dovetail pieces of wood or iron, or sometimes of stone, for dowelling two stones together.) A groove or channel 2 inches wide is cut on the bed, within 2 inches of its edge all round, being half an inch deep at the back, and 1 inch and a half at the front, where the middle plank projects 3 inches beyond the others; and a channel is cut through at *f*, called the lip, which is throated underneath, to prevent the liquor being wasted; *g* is a loose plank, 3 feet 9 inches by 3 feet 1 inch, of 3-inch oak, framed flush on both sides, used for the purpose of placing on the haircloths containing the pulp or cheese; *h* is the presser, which is of cast iron, 8 inches by 2 inches and a half in the centre, and 6 inches by 2 inches at each end, where a groove is cut 1 inch and a half by 1 inch to admit the oak guides that are nailed on the uprights, *b*. The presser is suspended by means of two slots, *i*, to the bottom of the iron screw, *k*, which has a groove turned immediately under its nave for the slots to work in. The nave of the screw is about 9 inches long and 8 inches in diameter, with two holes through its centre at right angles to each other, to admit an iron lever bar. The screw is 4 inches in diameter, and has a square thread of about one-seventeenth pitch, or 16 revolutions to the foot, working in an iron box, *l*, which has two lips cast on it to prevent it from turning round, being mortised and pinned into the top beam of the press, *m*, which is of the same size, and framed and pinned to the uprights, *b*, in a similar manner to *d*.

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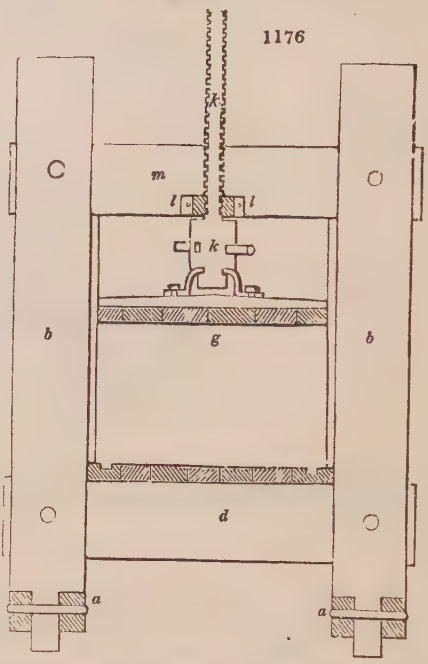

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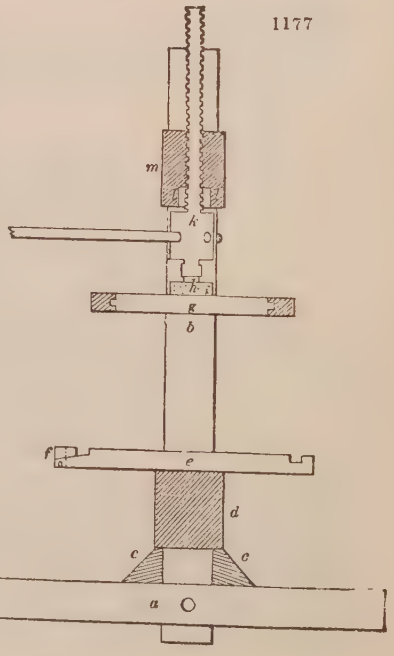

1298. *Specification* of the works to be performed in the erection of a cider-house, mill, and press, according to the plan most generally approved of in the counties of Hereford and Worcester, as detailed in the accompanying drawings, figs. 1176 to 1179.

1299. *Excavator.* To excavate the earth to the depth of 3 feet 6 inches, and of such breadth as may be necessary to allow for working-room. The space between the wall and the solid earth to be filled in on each side of the walls equally, as they are carried up, and the

remainder of the earth that may be excavated to be used to fill up the bed of the mill, or to be wheeled away to any distance required, not exceeding 20 yards.

1300. *Bricklayer.* The walls to be commenced with good brick or stone, 18 inches wide and 6 inches high, and reduced on that to 14 inches wide and 6 inches high; whence they are to be continued 9 inches thick to the roof; the whole of the bricks being of good quality. Common bricks are to be used laid in English bond in good mortar, made with the best lime and sand that can be obtained, or is used for such purposes, in the parish. The door and window cases to be properly set, and a brick on edge arch and platting course (a brick flat arch, over a brick on edge one) over each. The templets (short pieces of timber laid under raising plates to be well bedded in cornice to be worked under the eaves.

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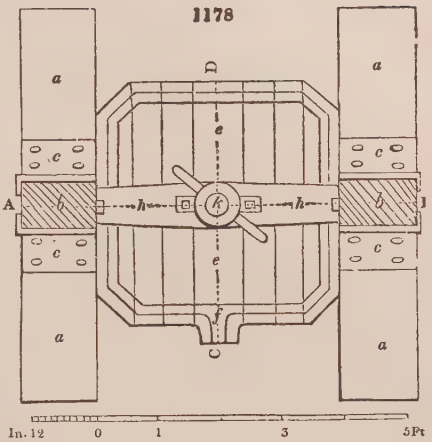

the beams, to distribute the weight), bond, and mortar on the walls, and a 3-brick diagonal dentil

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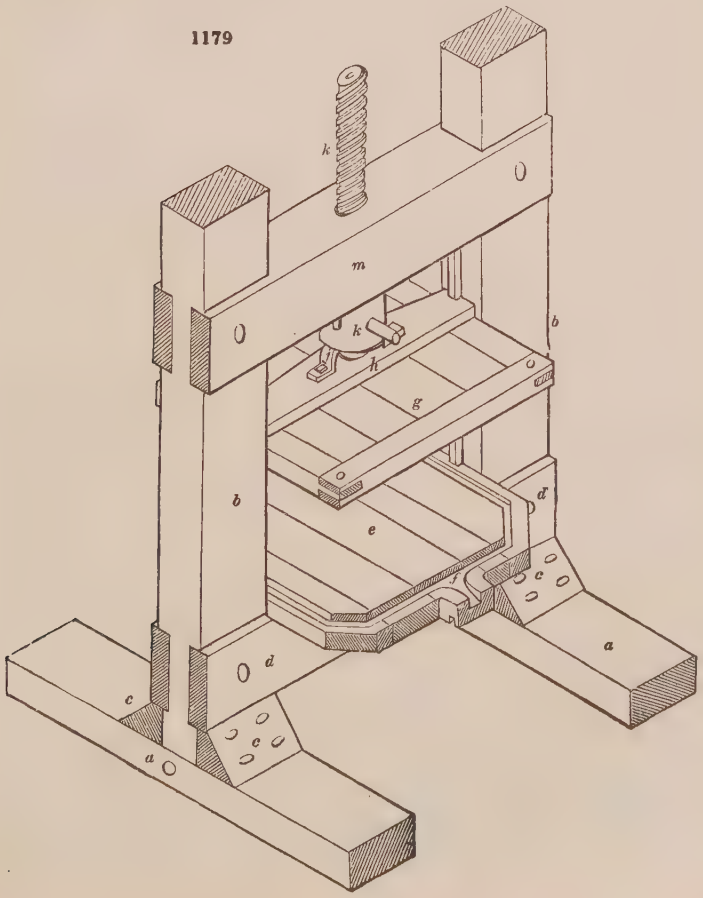

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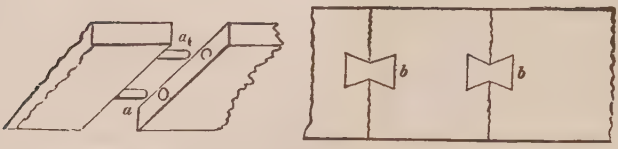

1301. *Carpenter and Joiner.* To provide two 5 inches by 4 inches oak beaded and rebated door-cases, 7 feet by 3 feet 9 inches in the clear; with 2 iron dowels in the bottom of each, 6 inches long and 1 inch square; and 2 1-inch centre-boards on each; having 1¼-inch red deal ledged, ploughed, tongued, and beaded doors hung to them with 20-inch hooks and hinges, put on with 1½-inch screws, and a good fine plate copper ward-lock of the value of 4*s.* on each door. Two one-light windows, 3 feet by 2 feet in the clear, to be provided, of 3 inches by 4 inches oak, with 2 1-inch centre-boards, and 3 iron bars 1 inch square each; 1-inch deal ledged doors, ploughed, tongued, and beaded, to be hung outside each window with 10-inch hooks and hinges, and fastened inside with hasps and staples. The templets under the tie-beams, and the bond timbers through the gables, to be of 3 inches by 4 inches oak, each in one length. The tie-beams to be of Memel timber, 10 inches by 6 inches; and the raising plates to be properly cogged down upon them, in one length of 6 inches by 3 inches Memel timber; the rafters to be also of Memel fir, 5 inches and three quarters by 2 inches, and 18 inches from centre to centre; the ridge-board, 8 inches and a half by 1 inch and a half, of red deal; the ridge roll (a piece over which the lead is turned on ridges and hips,) to be 1 inch and three quarters in diameter, supported by proper ridge spikes 4 feet apart; the tie-beam in which the top of the upright spindle works to have two diagonal stays of 6 inches by 4 inches Memel fir from its centre to the ends of the other tie-beam, being mortised, tenoned, and pinned to each other. An oak curb to be made to go all round the mill, and the millwright assisted in rimming it, and spindling the stone.

1302. *Slater.* The roof to be covered with Welsh blue duchess slates, having a 2½-inch lap on 2 inches by 1 inch red deal battens, and nailed on them with 2-inch copper nails, and torched (plastered at the crevices, to keep the wind out) on the underside with hair mortar.

1303. *Ironmongery.* To provide and fix cast-iron spouting with proper brackets at intervals of 3 feet; hopper head 2 inches down pipe, and shoe to each side of the building.

1304. *Plumber and Painter.* The ridge to be covered with 5-pound milled lead 22 inches wide, and both the doors, door and window cases, shutters and cast-iron spouts to be well painted with good white lead and oil paint three times.

1305. *Stone Mason.* To provide and set 2 pair of plinth stones and lead in dowels, each stone being 9 inches square and 6 inches thick. To provide and set stones for the bed of the mill as shown in drawings; the stones to be well and properly cramped with iron, and joggled together with good hard stone joggles (the same as doweled in carpentry; the use of the stone joggles is to prevent two pieces of stone joined together from sliding apart at the joint) where necessary. The stones to be of the best siliceous or grit kind that is usually procured for the purpose, and the millstone to be of similar quality. The millwright to be assisted in spindling the millstone, and in rimming the mill.

1306. *Millwright.* To provide every description of labour, and all kinds of materials that may be requisite for the completion of the mill and press, except the wood rim and stone bed of the mill, which will be provided by the carpenter and stone mason, both of whom will assist the millwright to rim the mill and spindle the millstone.

1307. *General Particular.* The whole of the works must be performed in a good, sound, and workmanlike manner, and every part made complete and perfect; using the best materials in every department of the works, and the whole being in conformity with the foregoing specification and the accompanying drawings.

1308. *Detailed Estimate of Cider Mill-house, Mill, and Press.*

	£	s.	d.
92 feet of lineal trenches excavated	0	10	0
1013 feet superficial 9-inch brickwork (or 2 rods 131 feet 4 inches), at 6*d.* per foot, or £10 : 4*s.* per rod	25	6	6
55 feet lineal dentil brick cornice, at 2*d.* per foot	0	9	2
3 squares 43 feet 9 inches of duchess slating, torched underneath, and copper-nailed, at 36*s.* per square	6	3	9

40 feet of lineal 3 inches by 4 inches oak ties and templets, at $4\frac{1}{2}d.$ per foot	0	15	0
60 feet cubic red pine timber, the beams, wall-plates, rafters, &c. at 3*s.* 6*d.* per foot	10	10	0
40 feet lineal 3 inches by 4 inches wrought oak rebated and chamfered one-light window cases, at $7\frac{3}{4}d.$ per foot	1	5	10
40 feet lineal 5 inches by 4 inches ditto, and beaded doorcases, at 1*s.* per foot	2	0	0
52 feet 6 inches superficial $1\frac{1}{4}$-inch ledged, ploughed, tongued, and beaded doors, at 11*d.* per foot	2	8	$1\frac{1}{2}$
26 feet 3 inches superficial 1-inch ditto ditto shutters, at 9*d.* per foot	0	19	8
10 feet superficial 1-inch beaded centre boards and blocks at $8\frac{1}{2}d.$ per foot	0	7	1
27 feet 6 inches lineal ridge roll, at 4*d.* per foot	0	9	2
2 cwt. 2 qrs. 15 lbs. 5lb.-lead on ridge, at 24*s.* per cwt.	3	3	$1\frac{1}{2}$
35 yards and one third painting in oil, 3 coats, at 9*d.* per yard	1	6	6
55 feet cast-iron eaves-spout and brackets, at 1*s.* $1\frac{3}{4}d.$ per foot	3	3	0
13 feet 2 inches wall-pipe, at 1*s.* 6*d.* per foot; 2 hopper heads, 10*s.*; 2 shoes, 6*s.*	2	0	3
9 3 feet 1 inch by 1 inch iron window bars, 31*s.* 6*d.*, and 3 pair 10-inch hooks and hinges, at 3*s.* 6*d.*	1	15	0
2 pair 20-inch hooks and hinges, 4*s.*; 4 6-inch dowels, 3*s.*	0	7	0
2 fine plate locks, copper wards	0	8	0
3 keys and pins to shutters	0	3	6
4 plinth-stones	0	10	0
Mill 10 feet diameter, 21*s.*, £10 : 10*s.*; runner, £1 : 1*s.*	11	11	0
Wood and ironwork to mill, complete	5	0	0
Press with iron screw	11	0	0
Total	£91	11	8

1309. *Remarks.* The foregoing Designs, descriptions, and the specification have been sent us by Thomas Prosser, Esq., Architect, Worcester, at the request of our kind friend, J. C. Kent, Esq., of Levant Lodge. The fidelity of the drawings, and the completeness of the details do the greatest credit to the Architect, who must be no less skilled in mechanics than in Architecture; and, what is of the greatest value, appears to be well acquainted with the uses of the different articles he describes. It may be observed, that in the following Design for a cider-mill and press, by Mr. Kent, there are some little differences in the details of construction. The principal of these are, that, in Mr. Kent's cider-mill, the grinding-stone is beveled towards the inner edge; whereas, in Mr. Prosser's, it is alike square on both edges. In Mr. Kent's press, the large square board, *g*, in fig. 1179, is loose; whereas, in Mr. Prosser's, it appears to be fixed to the bridge *h*. Another difference is, that the wheel moves directly on, instead of with the axle; thus lessening labour, and avoiding the necessity of cogs. The reason for having the square board or shooter loose, is to admit of blocks being placed between, to equalise the pressure, as (and that chiefly in the single screw presses) if the pile of must is not made perfectly even, it is liable to slip aside. By the use of blocks, also, a smaller quantity may be pressed with the single screw; as, without them, if the pile be low, the screw is drawn out too far from its purchase. It is evident that this last is a difference of very little moment; but, perhaps, beveling the inner edge of the grinding-wheel may render it easier to move along.

Design IX. — *A Cider-house, Mill, and Press, with the different Implements connected with Cider-making.*

1310. *The Cider-house* is usually a building with only one floor; or sometimes with a hay, straw, or hop loft over it. It is constructed of brick or of wood, in the same manner as a barn. For a mill of the following dimensions, viz., 12 feet in diameter, it should be, as a minimum, 22 feet long by 19 feet wide; and not less than 7 or 8 feet in height; being solely for the purpose of containing the mill and press made use of in extracting the juice from the fruit. The mill is erected at one end, leaving 3 feet and a half space between it and the wall, to allow the horse room to pass round. At the other end, facing the mill, is placed the press. It is advisable to have it sufficiently near the cellar to admit of an open pipe or trunk conveying the liquid from the lip of the press vat to a receiver placed in the cellar; thereby avoiding the waste of time and labour which would be otherwise consumed in carrying it down.

1311. *The Cider-Mill* for the purpose of grinding the fruit is constructed as follows: — Two, three, or four stones, as may be required, each being the segment of the horizontal section of a cylinder, are fitted and cramped together. In the Design before us, the diameter of the section of the cylinder is 12 feet, and its axis 2 feet; that is, it stands about that height from the ground. Into the surface of the upper end is cut a circular trough, within 2 inches of the periphery, termed the chace. fig. 1181, *a*; the side towards

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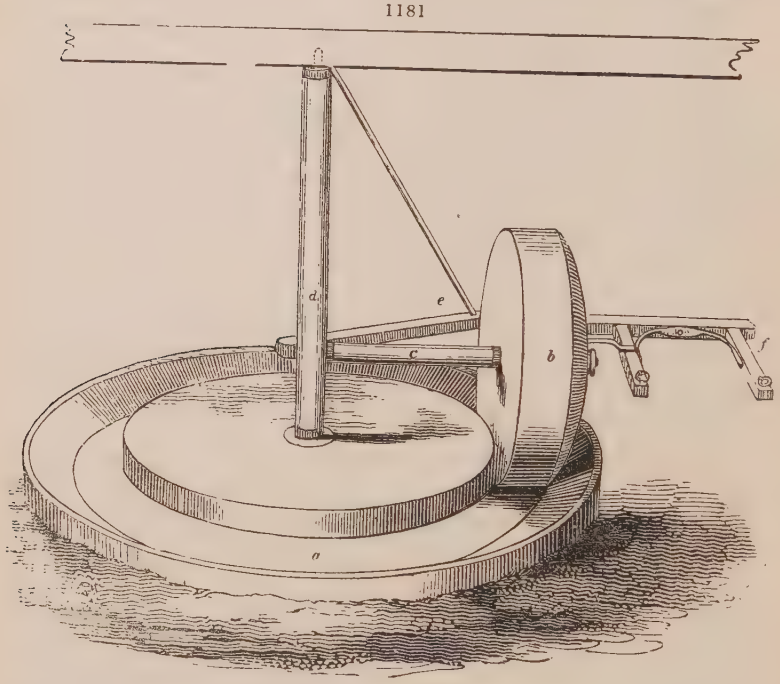
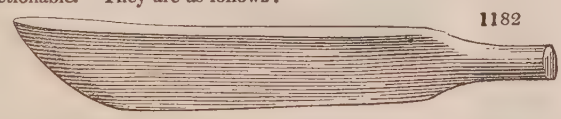


the centre is perpendicular, but the outer side slopes off, to allow the fruit to work up on that side when the roller passes over it, as being more convenient for the driver to push it down again to be recrushed. At the bottom the width is 1 foot 3 inches, at the top 2 feet, giving 9 inches for the slope. When first cut it is usually 5 inches deep, and a rim of wood, 4 inches high, called the nut, raises it on the outer rim, while a platform of wood to the same depth is fitted on the bed of the mill. This is removed when, by continual wear, the trough has become that much deeper. A circular stone roller, called the runner, *b*, is set on its edge, and revolves in the chace. It is 4 feet and a half in diameter, and 1 foot 2 inches wide on the edge, which is beveled off inwards on a slope of about three quarters of an inch in a foot, to facilitate its circular motion round the trough, and counteract the centrifugal tendency it would have, were it cut quite square. The inner side or face of the stone is perpendicular; but the outer is gradually rounded off from the edge, so as to be about 4 inches thicker at the axle. The surface of the edge of the wheel, as well as that of the bottom of the trough, should be rendered perfectly smooth, though it is a frequent custom to leave them rough, and even with inequalities, whereby the kernels, &c., of the fruit in great part escape untouched. This is done to prevent the roller from sliding; but the same object is better attained by a cog-wheel. In the Design before us, however, there is no danger of sliding, even without the aid of cogs. Through the centre of the runner is fixed a square bush of wood, to contain the iron boulk, or baulk, for the axle, also of iron, on which it turns to work. This axle passes into a larger wooden one, *c*, 5 inches thick; and is held firm by a pin, or key, fitting in a hole through both. This larger axle extends over the bed of the mill to a perpendicular spindle or shaft, *d*, through which passes a flat iron pin fixed edgewise in the axle. The hole in the spindle is elongated an inch upwards and downwards, with a width just enough to admit the pin freely. This prevents straining, by

allowing the short end of the axle to rise or fall as the stone does so, over the fruit in the chace. The spindle, also 5 inches thick, protected as well as the wooden axle by iron bands round each extremity, revolves by a pivot at either end; the lower one is provided with a shoulder working in the socket of a brass box fixed in the bed of the mill, the upper in a beam of the roof above. Attached to this, at the breast height of a horse, measuring from the ground, is a pole, *e*, 3 inches and a half square, passing horizontally, close before the runner; and being shaped so as to run directly out parallel to the axle. This pole extends about 3 feet beyond the mill, having two shafts, *f*, 2 feet 3 inches long and 3 inches square, 2 feet apart, projecting at right angles from it. Between these shafts the horse employed in grinding is yoked, his head being over the pole, and a short chain of a link or two from his collar being hooked on the projecting end of each shaft. The horse, having no other encumbrance save a head stall, is left quite free behind, allowing him to turn much more readily than when hampered with traces, which, moreover, continually rub against and gall his haunches. An iron rod from the top of the spindle to the pole, about 4 feet from the former, serves to strengthen it; and an iron box, in which the outer end of the axle is pinned close to the wheel, is also connected by an iron bar with this pole, which bar is also attached by a side stay to the inner shaft. Thus, then, the circular motion of the runner round the chace is effected by the revolving spindle, while the runner has a rotatory motion *on* its axle, instead of *with* it, as is the case with the runners in general use. By this method, the labour of the horse is diminished, and the necessity of cogs is superseded; because the wheel is much less liable to slide. This mill will grind about 90 bushels of fruit in a day, which on an average will yield 3 hogsheads of cider, of 100 gallons each; but the quantity ground depends much on the degree of care used in grinding. The stone employed in constructing cider-mills, or the vats of cider-presses, should invariably be of a siliceous nature; the malic acid having a stronger affinity for lime than the carbonic, which is present in all calcareous stone that could be made available for this purpose. The grey gritstone is preferable to the old red stone (in very common use), from its being less liable to crack and split, and from its wearing away much more slowly, owing to its greater hardness.

1312. *The portable Implements* used with the mill are all made of wood, metal being found objectionable. They are as follows: —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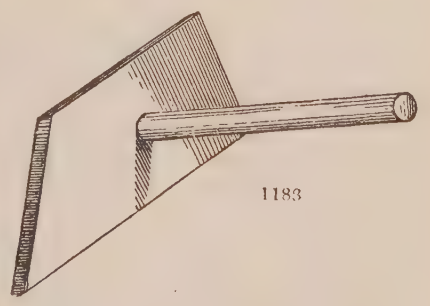
1313. *The Stirrer*, fig. 1182, for stirring the pulp from the sides, into the bottom of the chace.

1314. *The Reever*, fig. 1183, to push it up together for removal when ground.

1315. *The Scoop*, fig. 1184, to take it from the chace.

1316. *The Cider-Press*, for extracting the juice after the fruit has been ground to a pulp by the mill, consists of a sill of wood, fig. 1185, *k*, 5 feet 6 inches long, and 18 inches square, let into the ground about 4 inches. On this is placed the bed or vat, *l*, which is 4 feet wide by 4 feet and a half, and canted off at the corner: it is 3 inches in thickness, with an inch-square rim (preferable to a mere channel cut in the vat), which is raised round the edges to conduct the liquid to a lip cut through it in front whence it runs into a receiver. The vat should be of stone, though wood is often employed for the purpose. On either side, standing 6 feet from the sill, is an upright wrought-iron pillar, passing quite through it, and pinned on the under side by wedges driven through a keyhole. These pillars, for 2 feet 6 inches of their height, are square, the sides being 2 inches and a quarter, and smooth; above this square part they are cut into a screw, with a square thread, 2 inches in diameter, which makes 16 or 18 revolu-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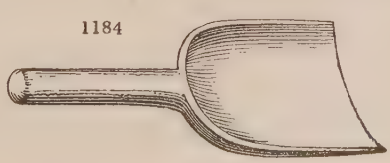
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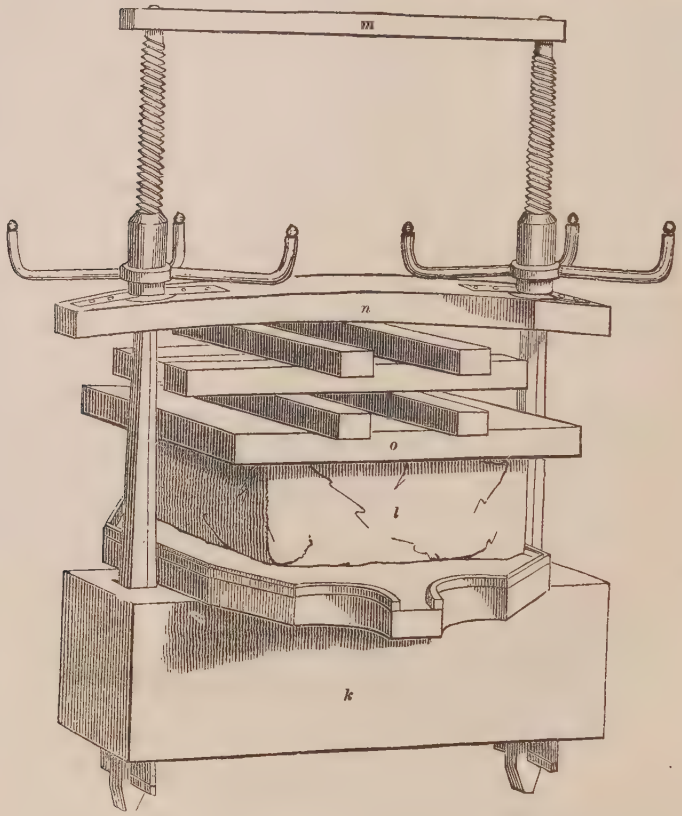

tions in a foot, extending 2 feet 10 inches, and the remaining 8 inches are finished off to an inch in diameter. This passes into a cross beam, *m*, 4 inches thick, strengthened by supports to the beams of the roof above. The screws pass freely through holes in a bridge, *n*, which is 4 inches thick, and a foot wide; and is suspended at each end by two slots (cross bars) playing on a rim round the lower extremity of the nuts, which serve to work it up and down. The nuts are each about 7 inches long, and turned by a collar, with 3 horns fitting into the nut, and prevented from slipping round by 3 lips on the nuts, corresponding to as many grooves in the collar. The horns are 1 foot 8 inches long, being turned up for 5 inches at the ends, to afford a more ready clutch. A square board, termed a shooter, *o*, and a number of oak blocks, 3 feet long and 4 inches square, are made use of; the former to lay flat on the pile of must, and the blocks to place two and two, crosswise, as many as may be necessary to raise it to the height required. These serve to equalise the pressure on all parts of the must. If the cellar be not sufficiently near to admit of an open trunk conveying the liquor at once from the lip of the press vat to a receiver in the cellar, a permanent stone cistern sunk into the ground beneath it is requisite.

1317. *This press differs from that in general use,* in which a single perpendicular screw works downwards through a fixed nut, and has an advantage over it in giving an increase of power, and as commanding greater certainty of an equality of pressure. The pair of screw pillars cost from £6 to £7; but they effect a great saving of timber and labour in its erection. In its use, care should be taken to screw down both the nuts equally, otherwise there is danger of breaking or bending the screws. On first commencing to press, this may readily be done by a man standing on the front of the vat, and turning one with each hand: but subsequently, when greater force is required, first one and then the other must be screwed down, only a little at a time; or, if two men are employed

they may be turned simultaneously. To obviate this inconvenience, some presses are provided with a cog wheel turning on a pivot on the centre of the bridge, and working on a rack fixed on each nut; so that, by turning the one, the other is turned also, and all danger of straining the screws is entirely prevented.

1318. *The Implements made use of are:* — the racking-can, tun-pail, dropping-bag, bottling-bench, and box for carrying bottles.

1319. *The Racking-Can*, fig. 1186, is made of oak staves in the same manner as a tub or cask. It is about 10 inches inside diameter at the top, and somewhat larger at the bottom, and about 11 inches high. The handle is of iron, and is fastened on by the hoops under which it passes. Round the top is an iron rim which clips the can for about an inch down, and then is bent out at right angles, to furnish hold for the hand in raising it. It contains about three gallons

1186

1320. *The Tun-Pail*, fig. 1187, is made in the same manner as the can. The diameter inside is about 1 foot 3 inches, and the height is 7 inches and a half; the back part being 3 inches and a half or 4 inches higher than the front. There is a leg, *a*, which, with a similar one opposite to it, serves to steady the pail when the spout which is fixed in the bottom of the pail in the direction *b*, is placed in the bung-hole of the cask to be filled. This spout is of copper, 1 inch and a half in diameter, and about 3 inches and a half from the raised back

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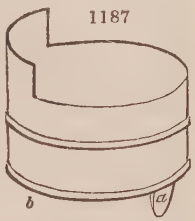

1321. *The Dropping-Bag*, fig. 1188, is formed of a yard square of stout canvass: the hoop at the top is about 1 foot 6 inches in diameter, and from the hoop to the point is 2 feet. When used, these bags are suspended on a ladder-like frame made for the purpose, to support any number that may be required.

1322. *The Bottling-Bench*, fig. 1189, consists of the seat, *a*; a basket for corks, *b*; and a tin cylinder fixed to the bench, *c*, to which a leathern bottle of the same shape fits closely in, to contain the bottle while being corked. The machine, *d*, is made use of for pressing the corks, to render it easier to put them in the bottles: it consists of two flat pieces of iron, each curved in an opposite direction, and joined at one end by a hinge; to the top one a handle is attached, the under one being fixed by legs to the bench. Both parts are toothed, to take a firmer hold of the cork. There is a circular hole, *e*, to receive a small can to hold a portion of the liquor, with which to wet the corks, in order that they may slide in the more readily.

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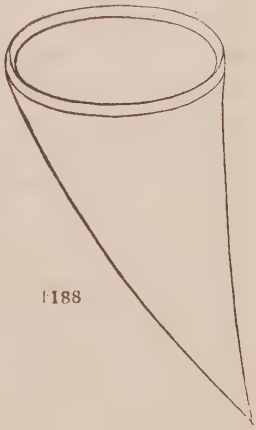

1323. *The Box for carrying Bottles* is generally made to hold from 4 to 12 bottles. Fig. 1190 is made to hold six. The square divisions on each are just large enough to admit a quart bottle, which should stand in nearly up to its shoulder.

1324. *The Use of the Cider-Mill, and the Process of the Manufacture of Cider.* The period for cider-making commences in September, but at that time only the wind-

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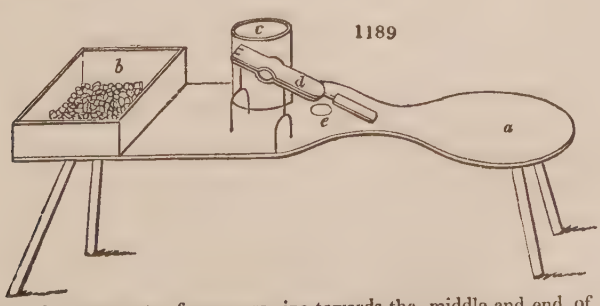

falls are ground: most sorts of pears are ripe towards the middle and end of October;

and, as they do not bear keeping so well as apples, perry is generally made at that season. The best sorts of cider should not be made before the beginning of November; and, in general, the later it is made, the better is the product. After being gathered, the fruit is usually placed in shallow heaps on the ground, in the open air, until signs of decay become visible in the ripest; but later in the season they should be placed under cover, to protect them from frost and rain: indeed, it were better, where space is at command, that this should always be done, provided the place where they are deposited be airy. Cider is made on almost every farm in Worcestershire and Herefordshire; as, even where there is no regular orchard, the isolated trees dispersed through the hedgerows furnish considerable quantities of fruit. The apples or pears (for when cider is mentioned it applies equally to perry, unless specifically stated otherwise) intended for grinding are scattered over the bottom of the chace; as, if they are put very thick, they cannot be crushed properly; care being taken to pick out any that are what is termed black rotten, as a few only of those would inevitably taint the liquor, and impart an unpleasant flavour to the whole. There is no objection to the fruit being what is called mosy, roxy, or sleepy, nearly synonymous terms, and all signifying fruit beginning to decay. The wheel being once set in motion, a boy or girl (and one of ten or twelve years old can efficiently perform the office) continually follows the runner, pushing down the pulp by means of the stirrer, fig. 1182, from the sides of the chace, up which it is continually squeezed, in order that it may again be crushed by the next revolution of the wheel. When the fruit is sufficiently ground (that is. when it is perfectly reduced to a pulp, the rind and kernels being thoroughly bruised), it is pushed or drawn up together by the reever, fig. 1183; and then with the scoop, fig. 1184, it is put into buckets, and carried to the press. More fruit is then thrown in, and the grinding proceeds as before. Those who are very choice in their cider put it aside in large tubs, to be exposed to the air for twenty-four hours, after which it is pressed, and it is even sometimes reground. There can be no doubt that exposing the liquor to the air is attended with good effects. Even during the short process of grinding, the air turns the pulp of a deep red colour; though whether this change takes place from the absorption of oxygen, or only from the mutual action upon each other of the different parts of the fruit, has never been accurately ascertained; but it is most probable that both causes have an influence dependent on each other. Certain, however, it is, that, if the juice of the apples be expressed at once from the fruit, it is a poor and thin liquid; whereas the juice of the commonest fruit, when exposed a good deal to the air, becomes quite red, and runs sweet and luscious when submitted to the press after being well ground. The pulp is placed in haircloths made for the purpose, from three feet and a half to four feet and a half square. One is first spread out in the vat, *l*; and when that is filled, another is put above it, and so on; just so much being placed on each haircloth as to allow of the ends being folded nearly into the centre. The workman (and one only, with the assistance of a little boy, is sufficient for all purposes) spreads the pulp, and beats it with his hands, kneading it close into the sides and corners of the haircloths as he folds them over. A mould is sometimes used to keep the pile to an equal and regular form. When from ten to twelve haircloths have been filled, the large square board or presser, termed a shooter, *o*, is placed on the top, and oaken blocks or bars are placed two and two, crosswise, as many as may be necessary, above; of course taking care that the top pair are at right angles with the bridge of the press, *n*. These blocks insure a more equal pressure over every part of the cheese (as the mass is called when in this state), and as the must, or pulp, sinks, it is sometimes necessary to increase the number of blocks in order to raise it higher. The press is then screwed down gradually, until it has extracted all the juice the fruit can yield. The must, or cheese, is then shaken from the haircloths, and put again in the mill to be reground (unless in very abundant years, when it is not worth the labour), and water is poured with it into the trough or chace. The must is afterwards again pressed, and about one hogshead of what is termed washings is obtained from the same quantity that had previously afforded about three hogsheads of cider. The cheese is finally dried for fuel, or by some used to feed pigs. A prejudice exists against its use as a manure, probably owing to its having been occasionally put fresh on the land in too large quantities, and in that case found injurious. Mr. Knight, however, states that he has known it to be beneficial, when mixed with quicklime, and allowed to remain until wholly decomposed. When family drink is required, which is that consumed by the household servants and farm people (and, indeed, on ordinary occasions, by the farmers themselves, and by most residents in cider coun-

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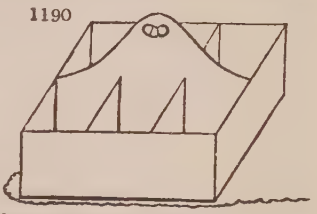


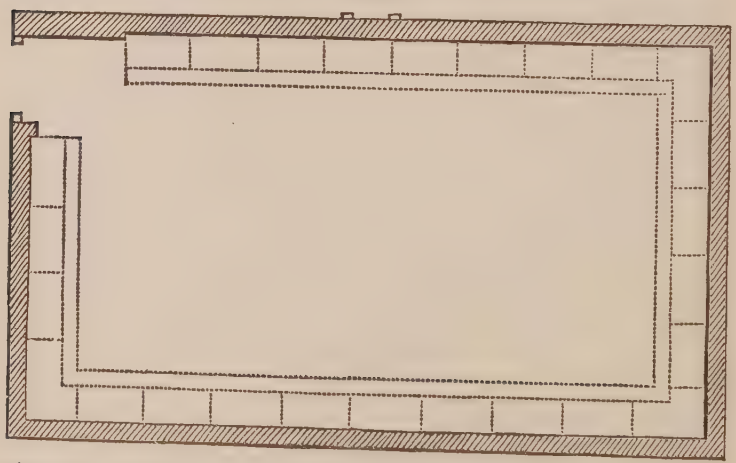
tries who drink it at all), a portion of water is poured into the chace with the fruit when even it is first ground. It is a singular fact, that, notwithstanding the immoderate quantities of this their sole beverage, which the labourers are in the habit of drinking at harvest time, when it is almost always extremely harsh, and very often quite acid, yet not an individual case of cholera has occurred in the county of Hereford, though few towns of the adjoining counties have wholly escaped. The juice is commonly received in a stone cistern sunk in the ground immediately under the lip of the press, and is thence conveyed to the cellar, which should be near. When practicable, an open spout may be used to convey it at once to a receiver placed therein. What is sold to the merchants, who buy the greater part of the prime and unwatered cider, is at once tunned from the press into hogsheads, and sent off by loads of three or four casks in a waggon, to the purchaser, who superintends its after-management himself. Although this immediate removal is liable to be prejudicial to the liquor, should rapid fermentation commence before it is stowed under the cider-merchant's care; yet, from his greater knowledge of its due treatment, and his paying it more attention, it is in most cases far superior in richness and flavour to what can be procured from the cultivators themselves. Cider drinkers, in the counties in which it grows, generally prefer that which is stout and rough (in fact, what others would term harsh), to the more refined and luscious beverage exported to distant places, where vinegar would be deemed a more appropriate name for what the cider-makers themselves prefer and retain. In the cellar it is usually tunned into hogsheads of a hundred gallons each, leaving a few gallons ullage. Larger hogsheads, of two, three, or four hundred gallons, are frequently made use of; and they are to be preferred, more especially after the liquor has become quite bright, and all active fermentation has ceased. Long ranges of casks are, however, in abundant seasons, placed on trams, and allowed to remain for a considerable period in the open air; where, unless the weather be very severe, the working (as it is called) proceeds equally well with that removed to the vaults or cellars. In forty-eight hours, or thereabouts, according to the temperature of the weather, &c., after the cider has been tunned, the feculent parts of the fruit, which have passed through the haircloths with the juice, are separated from the liquor, and thrown to the surface. When this is the case, no time should be lost in racking the liquor; for, if taken at this juncture, it runs off perfectly bright; but should it be neglected, the extraneous matter is again mixed with the liquid by the internal motion occasioned by the fermentation. After a few days it subsides to the bottom, though, when the weather is (as often happens in the season for cider-making) mild and warm, this period is protracted, and the cider is in proportion deteriorated. With this single racking the farmer is generally content; for he prefers a good, stout, rough beverage, to one of a more luscious quality, and moreover dreads the expense of continual care and rackings. The common family drink and washings most frequently receive no care whatever, from the time when the liquor is tunned, to that when it is tapped for use; and the grounds remaining in it cause a continual fermentation until it becomes acid, often so much so as to be fit for nothing but making vinegar. If it is intended for the cider to attain the highest perfection of which it is capable, it must be carefully watched, to prevent any active fermentation taking place; and, if this should be the case, it must be again racked, and this course be pursued until it becomes perfectly quiescent. The fewer the rackings required, the better the cider will be; for during each successive racking a portion of the spirit evaporates, and, if they be repeated too frequently, the liquor is rendered poor and thin. In this lies the great art of managing cider; and, in warm seasons especially, it is still a desideratum to discover some means of checking its too rapid fermentation, which is always induced by increase of temperature. When it has remained a short time quiet, and shows no disposition to renewed fermentation or fretting, if not perfectly star-bright, which it seldom is, it should be fined with isinglass; an operation which will, in some cases, require to be repeated two or three times, ere the maximum of transparency is obtained. The cask may then be stopped down close, but must be occasionally examined. It is usual to heighten the colour of the cider by the addition of a small quantity of sugar boiled with water until black: none is ever added to perry. Every time the liquor is racked, a certain quantity of lees will be found; and it is the presence of these which excites the fretting. These lees must on every occasion be put into bags, termed dropping-bags, suited for the purpose, by means of which the liquor mingled with the grounds is obtained clear, the feculency remaining behind. Some preserve the product of this separate; for from its having dripped drop by drop from the bags, and its long exposure to the air in the receiving-tub, it becomes quite flat, having, at the same time, parted with much of its spirit. Others, on account of that very flatness, return it back to the cask, as tending to check fermentation. Among other unfounded, absurd, and ignorant accusations which are alleged against merchants for doctoring their cider, it is affirmed that they are in the habit of mixing with it bullock's blood. The only use to which sheep's and bullock's blood is applied in the manu-

facture of cider is, to mix a little of it, and but a very little, while warm from the animal, among the lees, previously to their being put into the bags: in cooling, it coagulates, and aids the separation of the feculencies from the liquor. With the merchants, the time for putting cider and perry into bottles is in the spring following the season of its make; when it is necessary to mix a portion of old and sound liquor of the previous season's growth, to enable it to bear the transit, without endangering the loss of the whole by the bursting of the bottles from fermentation. Where not intended for sale, it may remain till the autumn, and may then be safely bottled, without any admixture; but the summer months being the season for consumption, when intended for the market it is absolutely necessary that the bottling should be done in the spring, about the month of March. The corks must be tied down with wire, and the bottles placed on their sides, without straw or sawdust. Mr. Kent desires us to add that "the above directions have been given empirically, without allusion to the theory of fermentation, and the chemical laws which govern the different changes that take place; beginning from the admixture, by grinding, of the fermentative, saccharine, aromatic, and astringent principles contained in the fruit, until the expressed liquid arrives at its state of a sweet and rich, a strong and rough, or a thin and acetous liquid. To have entered into such details would have occupied too extended a space, and, moreover, have appeared foreign from the general tenor of the work."

Design X. — *A House for breeding and fattening Poultry on a large Scale, with Remarks on their Management, and on the Suitableness of Poultry as Live Stock for the Farm Labourer; and Designs for altering or building their Cottages accordingly.*

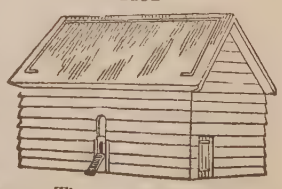
1325. *The Object of this Design*, which was furnished us by our much esteemed contributor Mr. Main, is to show the arrangement and details of a house, in which hens, ducks, geese, and other barn-yard fowls, may be hatched or fattened, and also the mode of hatching, breeding, and fattening them. Fig. 1191 is the ground plan of a poultry-house for general purposes; in which is shown the surrounding line of laying-boxes or

1191



fatting-coops, or both, according as the house may be used for either or both purposes. Fig. 1192 is the elevation, in perspective; showing the entrance hatch with its stair. Fig. 1193 is a cross section; in which may be seen the laying-boxes, *a a*; and the perches, *b b*, suspended from two purlins resting on the tie-beams. Fig. 1194 is a front view of the laying-boxes; and fig. 1195 is a front view of the fatting-coops. Both these are divided into lengths of three feet each, and the bottom, back, and top, in the divisions, are of boards. The front of the fatting-coops is closed with laths, about two inches wide, and about one inch and three quarters between. The centre lath of each coop is framed into a movable sill or foot, which foot has grooved or forked ends,

1192



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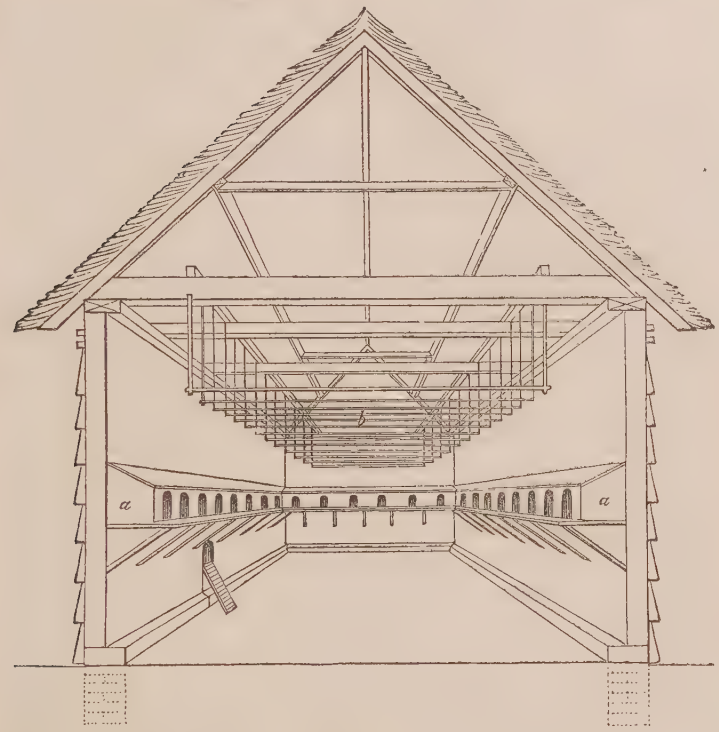
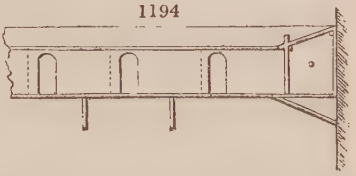


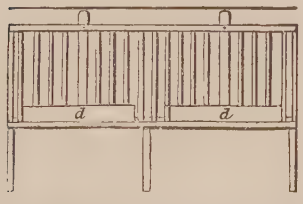
to admit of its traversing on the edge of the laths on each side, as shown at *a*. When this lath and its foot are lifted up, the space opened is sufficiently wide for the admission or exit of the fowl. The lath may be kept raised by a pin inserted in it through a hole in the top rail. Fig. 1196 is a section across this fatting-coop; in which may be seen, at *d*, the trough for food and water, of which there is one to each coop, and all are movable, in order that they may be cleaned.

1194

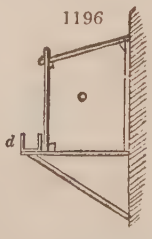


1326. *Construction.* "Poultry-houses," Mr. Main observes, "are generally lean-tos, or they may be built with a pitched roof, as in fig. 1192. The foundation, whether of

1195



1196



stone or brickwork, should be laid pretty deep, and solidly built, to prevent the burrowing of rats, stoats, and weasels. The walls are constructed of sills, plates, posts, and quarters, weather-boarded; the roofs of beams and rafters, connected by laths, or old hurdles thatched. The entrance opening, or hatch for fowls, should always be two or

three feet from the ground, with little ladders within and without, to prevent the visits of pigs. This hole has a slip shutter, within rebated cheeks, open in the daytime, but let down every evening, lest dogs, cats, or foxes should enter. Care should be taken that this opening be not so large as to admit *the thief's little son* or confederate, unless secured by a keyed bolt in the inside. The perches for fowls and turkeys are fixed at different heights from the floor, observing that no one perch be directly over another, nor should they extend over the laying-boxes. A flat board with steps nailed on is placed against one of the most central perches, to assist in mounting the chickens to their roost. All round the fowl-house, except at the door, is fixed a range of boxes for nests, as in the plan, fig. 1193. Ducks and geese have their breeding-boxes close to the floor; the doors being open during the day, and shut at night. On this account the doors should open into the orchard, or other enclosure where pigs are not allowed to come. These nestling-places, as well as those of fowls, are always bedded with clean straw frequently changed; and chalk eggs lie in them to attract the notice of the layers.

1327. *General Management of Poultry.* The following valuable practical remarks are by Mr. Main. They well deserve the attention of all those who are about to build poultry-houses, or who possess them already. Few persons are now aware of the great importance of such an arrangement of places, for all manner of fowls, as will admit not only of the most perfect cleanliness in management, but even of the renovation of the floor, sides, and fittings up, by extraordinary purification, every two or three years. Mr. Main's remarks on this subject are the result of much experience and long observation; and we have no doubt they will have their due weight both with Architects and poultry-feeders. "Every kind of poultry," Mr. Main observes, "should have a separate house, different kinds being exceedingly pugnacious towards one another. The individuals of every species are also very pugnacious among themselves; and, on this account, the number of cock birds is always limited. One cock to seven hens, one gander to six geese, one drake to six ducks, are the general proportions with regard to the commoner kinds of fowls; and one turkeycock and one peacock, are considered quite enough, on a moderately sized farm, for breeding purposes. The turkey, guinea-hen, and peahen are very fastidious in the choice of nests, and therefore require watching. If the latter fix on some secluded spot in the wood or hedges, she must not be removed; and, while sitting, will come home, call for food, and fly back to her nest. In such places they are in great danger of being killed by the fox; but, if a circle of peeled rods be placed archwise on the ground, at some distance round the nest, it will scare the marauder. Pea-fowls seldom roost in houses, preferring the tops of buildings, or the branches of trees. Every farm should have a place for fatting poultry, containing coops like those shown in figs. 1194 and 1195, fitted up for that purpose. Fowls are usually fattened with barley-meal and milk or water; and, if this is made thin enough, they need no drink. Geese are fattened with oats, given them in shallow earthen pans of water. Turkeys are best fattened with barley-meal and milk; but, with professional feeders, many rich and unnatural ingredients are mixed with their food, and forced down the throats of the helpless birds. Ducks are fattened like fowls, but must be allowed plenty of water. The flesh of poultry acquires flavour according to the quality of the food on which they have been fed. Musty or otherwise damaged grain is sure to be tasted in the fowl, goose, turkey, or duck that has been fed on it, however dressed: on the other hand, general cleanliness and sweet food improve the flavour of the flesh. Rotten or musty litter will taint the birds as well as their eggs. In fact, no poultry of any kind will thrive, if not kept perfectly clean; and, even with the utmost care, a place where poultry have been long kept becomes what the housewives call tainted, and where they will thrive no longer. The surface of the ground becomes saturated with their exuviæ, and therefore no longer healthy. To avoid this effect, some poulterers, in the country, frequently change the sites of their poultry-houses, to obtain fresh ground; and, to guard against the same misfortune, farmers, who cannot change their hen-houses and yards, purify the houses by fumigations of blazing pitch, by washing with hot lime-water, and by strewing large quantities of pure sand, both within and without the poultry-houses. Washing the floor of the house every week is necessary; for which purpose it is also necessary that it be paved either with stones, bricks, or tiles. The insides of the laying-boxes, fig. 1193, require frequent washing with hot lime-water, to free them from vermin (*Pediculus gallinæ* and *Pulex irritans Lin.*), which greatly torment the sitting hens. For the same purpose poultry should always have a heap of dry sand laid under some covered place, or thick tree near their yard for them to dust themselves in; this being their resource for getting rid of the lice and fleas with which they are annoyed. Geese may hatch eleven or thirteen eggs; ducks the same; fowls thirteen; turkeys, guinea-hens, and pea-fowls choose their own number. Turkey chicks cannot be reared, if hatched after the end of September. Chickens are subject to a disease called the roop or croope, which seizes them when about three weeks old, or just as the feathers appear on the head. It is caused by small worms breeding

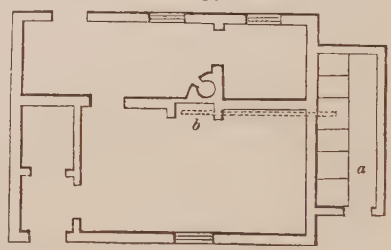
in the windpipe, in such numbers as to stop respiration, and which, if they cannot cough them up, soon kill them. An infusion of the yellow toad-flax (Linària vulgàris), a nauseously bitter weed, is given as a preventive, but is seldom successful." We have already (§ 770) noticed the great advantage of heat for the common hen, when laying, hatching, or rearing in the winter season. Mr. Main's remarks are so complete, that we can add nothing to them, except strongly recommending the poultry-house always to be placed in some position in the farm-yard where it may benefit either from the warmth of cattle, fermenting dung, or a fireplace in constant use.

1328. *The peculiar suitableness of Poultry as Live Stock to a Farm Labourer* will not be doubted by those who have attended to the subject. A correspondent observes that it has long been a common saying, that none but Scotch highlanders or Irish cottagers have the luxury of fresh eggs in winter, or very early chickens in spring; and, as their poultry are of the common breeds, the cause of their continuing to lay eggs when others stop, can only be, that they roost in the same rooms with their owners, enjoy some little warmth, and probably live partly on cooked food. On the other hand, the poultry which are lodged in places fitted up for them in farm buildings, or other outhouses, are forced to endure a much lower temperature, during winter, than is suitable for their laying at that season, and to live almost entirely on uncooked food. We may add, also, another important consideration, which is, that the poultry which live with their owners enjoy a superior degree of cleanliness to those who live in even the cleanest poultry-houses. Even in the lowlands of Scotland, the poultry roost, in many places, over the box-beds, or on the collar beams over the living-room; and the laying-place is well known to be in the straw at the bottom of the box-bed. In several parts of France and Germany the peasants rear and fatten poultry for the market as a business, and in most places every man who has a house has also poultry, which, as in Scotland, are lodged within its walls; and fed chiefly on cooked food. On both sides of the Lower Rhine, almost every peasant fattens one or two geese, and sells the livers (*les foies grasses*) to the nearest inn, or rich man, or takes them to market, and counts on obtaining for them as much as will pay for the food of the geese, retaining the flesh and feathers as clear profit. Every Englishman who has travelled in the north of France and the south of Germany must have been struck with the superiority of the poultry which he meets with at the inns in those countries, to that which he finds in the inns of his own. The cause appears to be, that the breeding and fattening of this description of live stock is in the hands of those who can afford sufficient time to enter into all the minute details necessary for insuring complete success, attended at the same time by profit. In Britain, the large farmer cannot do this, while the labourer is precluded from doing it by different causes, but chiefly, we believe, from ignorance of the practice; and of the benefit which he might derive from it. We except, however, from this charge the families of labourers in particular districts: such as the neighbourhood of Wokingham in Berkshire, famous for its fat fowls; and the neighbourhood of Aylesbury, for its early ducks, &c. Were the mode pointed out to the wives of farm labourers by which they could rear and fatten poultry in the best manner, and induce hens to lay and hatch in the winter season, the profit they would soon obtain from taking the articles to market would be an inducement for them to carry it on. It is well known that poultry have been long hatched, in the neighbourhood of Paris, by hot water, and they might easily be so any where, either on a large or a small scale. (See *Gard. Mag.*, vol. iv. p. 305.) Chickens have also been hatched in the bark-bed of a hot-house, by sinking a half hogs-head barrel in the tan, placing the eggs in a basket at the bottom covered by a piece of flannel, and covering the top of the cask with a flat board. For details see *Gard. Mag.*, vol. viii. p. 688. It is not our business, in this work, to enter into farther details on the subject; but it is our duty to show the architectural arrangements, in cottages, which are required for putting it in practice.

1329. *The Poultry-house for the Cottager*, who would have his hens lay during the winter, must in some way or other derive heat from the fireplace of his living-room. There are several ways in which this may be accomplished, both in cottages already existing, and in new cottages. In cottages already existing, the living-room fire is either placed against one of the exterior, or one of the interior walls. When it is placed against an exterior wall, a poultry place is easily formed by a small lean-to building, erected outside the house, against the back of the fireplace; and, if the wall behind the fire be so thick as not to admit of much heat escaping to the outside, a part of it may be taken out, and either a thinner wall, or a fire-stone or fire-brick partition, or, what will be most effective, a cast-iron plate, substituted for it. Where the principal fuel is wood or peat, and the fire is made on the hearth, less heat will escape through the wall, and in that case there may be a pit formed under the fireplace, of its full width, and extending under the wall, and the entire floor of the poultry-house outside. Into this pit, the ashes from the fire may be allowed to drop through a grate, and the heat from them will thus be

communicated to the floor of the poultry-house. In all cases, the walls of this poultry place should be of sufficient thickness to retain heat, and more particularly the roof, which should have the space between the ceiling and the slates or tiles filled in with hay or straw, as in Holland. The walls and doors may also, in very severe weather, be covered with straw mats of the kind used by gardeners in covering hot-beds; or the entire lean-to, roof and sides, may be thatched. When the fireplace of the living-room is against an interior wall, there are three ways in which heat may be derived from it for warming a poultry place. That the most readily practised, we believe, will be, to form a small lean-to, on the south or south-east side of the house, with a hollow floor, having a stone or plate of iron to lift up, and admit of placing hot ashes or embers beneath it. If the hovel be properly constructed for retaining heat, as just recommended, and hot embers be put under the floor once a day, it will be sufficient to keep up a temperature of from fifty degrees to sixty degrees, in even the most severe weather. It must be recollected, however, that we suppose, in this case, either double doors and windows, or external coverings to them of straw. A second mode is, to communicate heat to a cistern of water, or a bed of stones, under the floor of the poultry hovel, by pipes passing through the kitchen fire; but this, though an extremely simple mode, and by no means expensive, is yet so much out of the common way, that the farm labourer could hardly be expected, in his present state, to consent to its adoption. We shall, however, show with what ease it might be accomplished. Fig. 1197 is the plan of a cottage, in which it is desired to heat the poultry-house, *a*, from the fireplace, *b*. Care being taken to form the floor of the poultry-house not much lower than that of the room containing the fireplace, place in the former a stone or wooden cistern, a foot or more in depth, and of any convenient length and breadth. A poultry-house containing 10,000 cubic feet of air need not have a cistern containing above 100 cubic feet of water. Let either the bottom or the top of the cistern be placed on a level with the bottom of the fireplace. Then, supposing the former, which is preferable, to be the case, take a small iron pipe, rather more than twice the length of the distance between the cistern and the kitchen fireplace (that used as gas-pipe, about an inch in diameter externally, and which may be had for about 4*d.* per foot, is the best), and bend it in the middle, so that the bent end may lie in the bottom of the fireplace, and the open ends in the bottom of the cistern in the poultry-place, as shown in the section fig. 1198, in which *c* is the fireplace; *d*, the two pipes; and *e*, their ends in the cistern. The end of one of these pipes is shown turned up one inch, and the other several inches, to promote the circulation by destroying the equilibrium which necessarily exists when the orifices of both tubes are on the same level. If, instead of the bottom of the cistern being on a level with the bottom of the fireplace, its top is on that level, then it is only necessary to reverse the pipes, as shown in fig. 1199, taking care that they are first filled with water, when the circulation will take place on the siphon principle; and be effective in heating the air of the poultry-house, either directly by radiation, or through the medium of a coat of stones or gravel, as may be considered best. The cistern, or receptacle for water, may be an old iron pot or kettle, or a large jar. A body of water will very soon be heated by either of these methods; and that body may be surrounded by a mass of stones or gravel, which will thus accumulate a quantity of heat, to be given out by degrees, according to the temperature of the poultry-house. Where gas pipe cannot be got, even lead pipe will answer for a short time; because it will not melt, while there is a circulation of water at a lower temperature than 200° going on within it. An excellent description of apparatus for being placed in the fire might be made of cast iron, or of terro-metallic earth; and, at the distance of a foot from the fireplace, a lead or wooden pipe might be joined to it, either of which would answer as well for circulating the water as pipes made of any

1197



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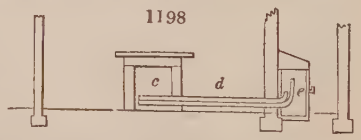

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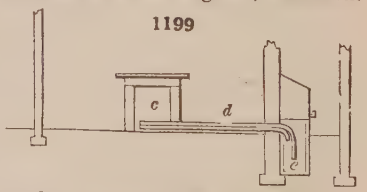
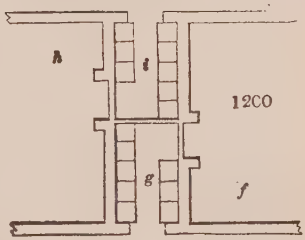
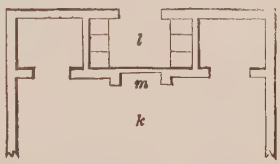


other material. Thus, there cannot be a question as to the cheapness of this mode, and still less of its effectiveness. The variations, also, which this mode admits of, are almost endless; for the pipes may be so arranged as to heat a cistern of water, or poultry-house, not only on the same level with the fireplace, but on any floor above its level, or on the cellar floor below it. A perfect level, however, will always be found the cheapest mode. The third manner of conveying heat from the fire of a cottage living-room to a place for poultry, is to form a chest or box, say three feet wide, three feet high, and six feet long; which will afford room for two floors of eight nests each; and either to keep this in the living-room, its top serving as a table or dresser; or to place it in a garret, back-kitchen, or outhouse; and supply it with heat by earthenware bottles of hot water, set in the corner of each nest; or by a vertical cistern of water, which might form the separation between the nests. Where a box of nests was adopted, however, the best plan would be, to place it in a garret or other floor over the living-room; for we cannot recommend the practice, not unfrequent in the small farm houses in France, of hatching poultry in large quantities under the kitchen dressers. Where there is an oven in frequent use, a poultry-house may be very advantageously placed in contact with it; and where the floor of the dwelling is heated by flues, or by steam in a bed of stones, there never can be any difficulty in conveying a part of the heat to an outside poultry-house. It is only necessary to extend the flues under its floor. Neither can there be the slightest difficulty in contriving a poultry-house to be heated from the fire of the living-room, when a new cottage is to be built; for, in the case of a double cottage, two poultry-houses may be placed between the two dwellings, as in fig. 1200, in which *f* is one dwelling, and *g* its poultry-house; and *h* another dwelling, and *i* its poultry-house.



In the case of single cottages, the poultry-house may either be a lean-to, as proposed for old cottages, or it may be a recess, as in fig. 1201; in which *k* is the dwelling, and *l*, the poultry-house; the back of the fireplace, *m*, being supposed to be a cast-iron plate. Perhaps we have gone more into details on this part of our subject than to some may appear necessary; but we are extremely anxious to introduce poultry-houses of an improved kind, generally, into the cottages of farm labourers; and an important step to this is, to make Architects and their employers aware of what is wanted.

1201



SECT. V. *Designs for Farmery Dwellings for Ploughmen and other Yearly Servants employed on the Farm.*

1330. *Every Scotch Farmery has some human Dwellings belonging to it,* in addition to that of the master; and, in most districts, there is a room, or a couple of rooms, in some places called a bothy, for the single men, with one or more cottages, in a line, not far distant from the farmery, for men having families. This is one of the great advantages which the modern farmeries of Scotland, and of the north of England, have over those of most other parts of the island. In consequence of these dwellings, the men employed in taking care of the horses, and in other agricultural labours, being always on the spot, are enabled to commence their work in the morning, without being previously fatigued by getting up very early, and perhaps walking a mile or more to the farm; and they can also afford to stay later on extra occasions; always arriving at home less fatigued in the evenings, than they could do under other circumstances. The wives and families of such men must evidently be much more comfortable than when the man has to go a distance to his work; and the master must feel proportionately satisfied by being enabled to consider his ploughmen as forming part of his family. It is well known in Scotland, that the ploughmen who live with their families on the farms on which they work, and who are paid partly in money and partly in kind, are the most comfortable, moral, and laborious of country workmen; and it appears to us to be very desirable that the same practice should be introduced into the midland and southern districts of England. We have seen, in § 795, that those in Scotland are sufficiently wretched; and, in § 996, that those in the north of England are little better. In the agricultural counties of the south and west of England, the cottages of the ploughmen are generally more commodious than those in the north; though those of some of the midland counties, Buckinghamshire for example, may be referred to in proof of a contrary opinion. Various attempts have been made to introduce improvements into this class of dwellings, and we shall here bring together

a few plans devised by different individuals for that purpose; previously giving the plan and interior arrangement of ploughmen's cottages as they now exist in Scotland, in Northumberland, and in Wiltshire.

1331. *No great Improvement in the Cottages of Farm Labourers*, however, can be expected, till the farmer looks upon his labourers in a very different point of view from what he does at present. The relative situation of these two classes is that of seller and buyer, or rather master and slave; the one trying to get a maximum of labour for a minimum of remuneration, and looking upon his labourer as a being inferior to himself, and, in short, as little better than a beast of burden; and the other regarding his master as his natural enemy, to be taken advantage of on every occasion where it can be done with impunity. With a superior degree of knowledge in both parties, the labour of the servant, and the wages and accommodation of the master would be merely looked upon as articles of exchange, inferring no degree of obligation on either side; and, in those fluctuations in the price of labour which must ever take place, implying no greater personal subjection, or inferiority of dignity, than now takes place between foreign and British merchants, when regulating their accounts according to the rate of exchange between their respective nations. This desirable result can only be brought about by universal education, by which every man will be enabled to rise in the scale of being, in proportion to his native intellect; and all will be essentially alike in what relates to manners; which, after all, have more influence than even intellect in conferring personal dignity.

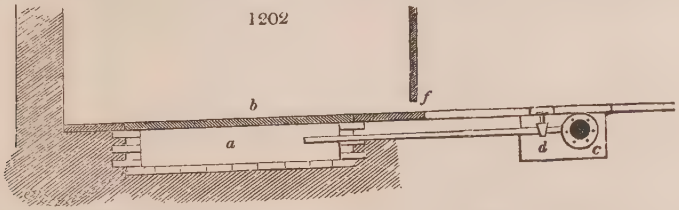
1332. *When every Farmer and the Labourers settled on his Farm* shall consider themselves more in the light of a small cooperative society, and it shall be the interest of the one party to act for the benefit of the other, as well as for his own advantage; then will the comfort and happiness of both be greatly increased: the labourer will cease to look upon his employer as a hard taskmaster, and the master upon his servant as a mere instrument of labour, or an unwilling slave; then will kindly feelings be again awakened in both bosoms, and the wish to confer mutual benefits revive. Tyranny and servility have alike a tendency to harden the heart and to stifle all the better feelings of human nature: there is much of both in the present situation of labourers and their employers; but let labour find its fair value in the market, and be regarded only as an article of barter given in exchange for wages, and the moral condition of the labourer will be raised; he will feel himself restored to the dignity of a responsible agent, and all the nobler feelings of his nature will be called forth.

1333. *One of the first Results* of a right understanding between farmers and their labourers will be, the enjoyment of certain accommodations in common; such as an oven, a brewhouse or cider-house, a wash-house and washing-machine, a mangle, and a mode of heating. We will not go farther than this, though we might anticipate something nearer patriarchal equality; for the height of refinement is to return to simplicity: but there is this difference, that the one is the simplicity of knowledge, and the other the simplicity of ignorance. One of the first sources of comfort which, in cold countries such as Britain, the farm labourer will enjoy in common with his employer is, we think, artificial heat. Of all the laborious, wasteful, and extravagant modes of procuring this necessary of life, that of employing open fireplaces is the worst; being scarcely more than one step removed from the savage practice of lighting a fire in the middle of a hut, sitting round it, and feeding it with boughs. The Chinese, and the Continental nations of Europe, even the semi-barbarous Russians, are far in advance of us in this respect. We have suggested the mode of heating by smoke-flues under the floors; but even this is a comparatively imperfect mode, to what may be practised in every farmery, after steam shall have been as generally introduced for driving threshing and other machinery, and cooking food for cattle, &c., as we are persuaded it very soon will be. Our attention has been called to this subject by an enlightened correspondent residing in Edinburgh, whose communication, given in his own words, will enable the Architect, with the greatest ease, to devise the means of heating the floors of farm houses, farm labourers' cottages, and farmery bothies, from the same steam-apparatus which is erected in the farmery for cooking food for the live stock.

1334. *Heating the Floors of Cottages by Steam.* "The excellent method you propose for heating the dwellings of the working classes is, unfortunately, limited to situations where a fireplace can be established on a lower level than the floors which are to be heated; and is, besides, objectionable in localities where the nature of the coal employed causes a rapid deposition of soot, by which the heat abstracted from the fuel is, in great part, forced along into the exterior atmosphere. In such situations, an arrangement may be adopted, which has been successfully applied here, in the following case: — The Police Office being built on the side of very steep ground, the front of the building is about 20 feet higher than the back part. A range of cells for prisoners had been added on the lowest level, and were so situated that it became a difficult question how they were

to be heated and ventilated during cold weather. I suggested the following method, which was adopted, and succeeded. In the floor of each cell a pit, fig. 1202, *a*, was

1202

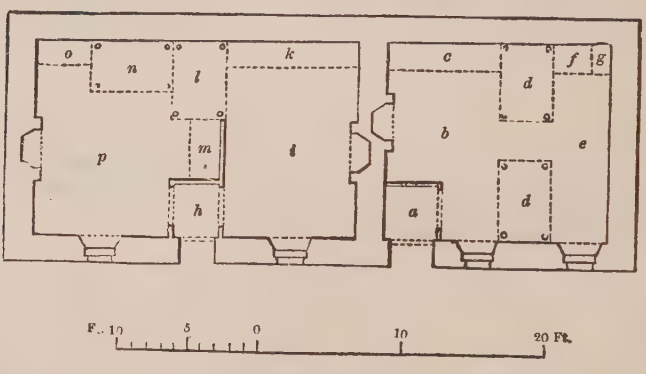


formed, of 4 feet long, 2 feet wide, and 1 foot and a half deep, lined and floored with brick and mortar, and covered by an Arbroath or Caithness flag, *b*, forming part of the permanent floor of the cell. This pit was filled with hard materials, such as very coarse gravel, road metal of broken whinstone, &c. A close steam-boiler, which was erected in a higher part of the premises, was made to transmit steam to a pipe, *c*, which was laid along the passage in which were situated the doors of the cells, and from this pipe a branch, with a stopcock, *d*, went off to each pit. The pits were laid with a little declivity towards one corner, from which a piece of bent lead pipe, *e*, carried off condensed water, or allowed steam to escape if its pressure exceeded an inch of water. The doors of the cells were left half an inch free from the floor, as shown at *f*; and from the ceiling of each cell, at the extremity farthest from the door, a flue was carried into the exterior wall of the building. From this disposition it results, that, when, by opening the branch cock, *d*, steam is admitted into any of the pits, it is condensed among the hard gravel, and parts with its heat, until the whole mass has acquired a high temperature; after which, if allowed to continue to pass into the pit, it would blow off by the bent lead pipe, *e*. The whole pavement of the cell soon becomes warm; and the air, on being heated, gradually rises, and passes off by the flue near the ceiling; its place being supplied by a stratum which flows in under the door at *f*, immediately over the hottest part of the floor. The cells, though small, are in this way well ventilated, and when washed out they dry immediately. In such an arrangement, care should be taken that the pipes be all laid to a declination at which the condensation may escape by a hydraulic joint. In the first fitting up of the apparatus at the Police Office, a lead main was employed, which was supported only at certain distances. It soon, however, bagged between the supports, when water lodging in the bends stopped up the steam-way. This lead pipe being removed, and a small cast-iron gas main being substituted, every cell, or any particular one, became capable of being heated to any degree required. The turnkeys, from experience, know the time a cock requires to be left open to communicate heat enough for the whole day to a cell; and they find that, though the necessary quantity be rapidly imparted to the mass of stones, it is so gradually given out, that a very equable temperature is easily maintained. The last is a valuable property of this method, when the source of heat is to be the kitchen fire, which is naturally of variable strength at different periods of the day; and, therefore, not available for applying heat by means of the surface of steam-pipes, or by currents of heated air." Of all the different modes of heating rooms on the basement story of a house, in which the floors are of brick, stone, or composition, there can be no doubt that much the most efficient mode is by steam; we do not think that there is any mode of applying it more economical than that suggested by our correspondent. It is a great recommendation to this plan, that the heat may be deposited among the stones at any period of the day, so as to be given out in proportion as the temperature of the air over the floor is lowered. Though it would seldom answer to heat a single cottage in this manner, yet in most districts no plan could answer better for a number of cottages, when placed together. The same mode has been applied to the heating of hot-houses, and especially pine stoves and pits, by Mr. Hay, Garden Architect, Edinburgh, (whose invention, we believe, it is,) with the most perfect success. (*See Gard. Mag.* vol. viii. p. 330 and 730.)

Design I. — *Two Ploughmen's Cottages, such as are in common Use in the Carse of Gowrie; with a Notice of the Bothies, or Lodges for single Men, in the same District.*

1335. *Our object*, in giving the present Design, which, at our request, has been furnished by Mr. Gorrie, is to show how a minimum of accommodation may be maximised in use. Fig. 1203 is a ground plan of two cottages, one with only one fireplace and two windows, and the other with two fireplaces and two windows. The first shows the method of partitioning off a small apartment by means of two box-beds; and the second, or that with the two fireplaces, shows how the box-beds are disposed when there is more

1203



space, and a partial partition in the middle. In both cottages, the disposition of the principal articles of furniture is shown. In the smaller cottage, *a* is the porch; *b*, the living-room, eight feet by fourteen feet; *c*, the dresser; *d d*, two box-beds (one of which opens into *b*, and the other into *e*); *e*, a small bed-room or passage, four feet by fourteen feet; *f*, a chest of drawers; and *g*, a cupboard, or press. In the cottage with two fire-places, *h* is the porch; *i*, the living-room, fourteen feet by nine feet and a half; *k*, the dresser; *l*, a box-bed opening into the kitchen; *m*, a chest of drawers; *n*, a box-bed, opening into the ben, or parlour; and *o*, a press. The ben, or parlour, *p*, is, like the kitchen, fourteen feet by nine feet and a half. It will be observed that these dimensions are from wall to wall; so that the areas of the floors are very much diminished by the box-beds, the chests of drawers, and the dressers. The elevation is of the rudest kind, the roof is covered with thatch or grey slate, with shapeless chimney-tops formed of straw, sticks, and mud, and window-openings about two feet and a half high, and eighteen inches wide, with a frame containing four small panes of glass hinged at one side.

1336. *The following Description of these Cottages* has been sent us by Mr. Gorrie: — "The accompanying sketch, fig. 1203, shows two houses for ploughmen having wives and children, in the style most prevalent here. The largest is twenty-two feet by fourteen feet within the walls, and seven feet high. The dotted lines show the site of the box-beds, press, and the bride's chest of drawers; the latter being always a part of her dowry, and made of mahogany. The porch, you will see, is within-doors, and its walls are made of straw or clay, about four inches thick, covering wood supports (clay nogging). The outer walls of the cottage are built of rubble-stone, without any hewn-work. The chimney-flues are formed of the same material as the porch partitions, faced with wood. There is a hearth-stone, three feet by two feet and a half. The floor is laid with clay, and is quite smooth; seldom with wood or flags. The walls are not, I am sorry to say, often plastered within; but they are sometimes whitewashed. The rooms have seldom plaster ceilings, but they are uniformly formed of small wood laid on joists, and covered with turf. On this primitive loft, fuel, such as split wood, is laid, being conveyed to it through a hatchway above the porch: it is also a receptacle for lumber. The roof is thatched with reeds or wheat straw; or, if near any slate quarries, where that article is cheap, and reeds and straw scarce and high-priced, slates are used; tiles are very seldom to be met with. The ridges are covered with turf, and the chimney-tops are of the same materials as the porch partition below; that is, straw ropes, clay, and wood. The largest cottage may be reckoned a specimen of many cottagers' houses built about forty years since: recently they are more tastefully erected. In all cases they have a *but* and a *ben*, although two fireplaces in ploughmen's houses are not common. Such a cottage as the smallest of these, rents (for labourers) at 35*s*. a year, and this is considered as part of the wages of a married ploughman. This, with ten falls of garden ground, twenty falls of field potato-ground, (a fall is 36 square yards,) a cow kept, six bolls and a half of oatmeal, and £8, is about a ploughman's yearly wages. A foreman who sows, and builds ricks, has about £4 more."

1337. "*Bothies* (boothies," or little booths), Mr. Gorrie continues, "are of long standing as dwellings for ploughmen; and they are very simple erections. The beds are generally on the same floor as the cooking-rooms; a very bad arrangement, as it affords temptation for men, when fatigued with labour, to recline on them, without much attention to cleanliness or comfort. The size of the bothy, or lodge, is regulated by the number of the men for whom it is designed, reckoning two for each bed; the only other fur-

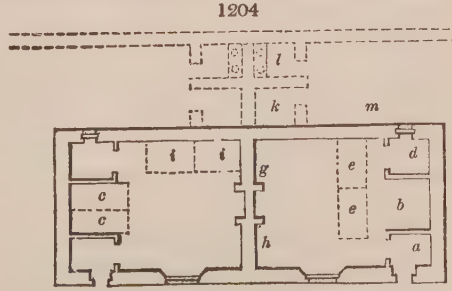
niture being a four-legged stool, some meal-boxes, and the ploughmen's boxes, which contain their linen and Sunday clothes, of which they are generally careful. Bothies now erecting have an *upper story* for beds, and a box for holding meal in the cooking-apartment. The utensils consist of one pan or boiler, and each man provides himself with a wooden plate and spoon."

1338. *Remarks.* Our readers cannot fail to observe the important service rendered by the box-beds, in the division of these cottages into two rooms: without them the apartment would be a miserable hovel; for no description of open bed could ever either be so comfortable in itself, or admit of such an arrangement as would give any privacy to any part of the enclosure. At the same time, it must be acknowledged that the closeness and concealment produced by these beds, and the general crowding together of so much in so small a space, are any thing but favourable to cleanliness and even delicacy. The remark made by Mr. Gorrie, on the temptation afforded by having beds in the living room, "to lie down in them without much regard to cleanliness or comfort," is most important. The very circumstance of having to go up stairs to a bed-room is favourable to cleanliness, as well as to health; because, in proportion to the completeness of the division of purposes or uses in a dwelling is the perfection to which each may be attained. The first step towards both cleanliness and comfort is order, or having a place for every thing; and this can never be obtained, that is, no person can be orderly, where things used for totally different purposes are crowded together in a small space. Very little improvement, therefore, can be expected in the taste of the Scotch ploughman or his wife, till they have more room; and till they have beds in rooms by themselves, which admit light on every side, and a free circulation of air, above, below, and around. The box-beds form an admirable partition; and, indeed, taken altogether, are astonishing contrivances for surmounting difficulties; for, when we consider that the Scotch ploughmen are liable to change their masters, and, of course, their hovels, once a year, by what other means could they render such miserable abodes so habitable, without incurring the expense of fixed partitions, which, on removal, they could not carry with them? When two separate bed-rooms are obtained, the bride's chest of drawers will be placed in the best of them, and this will pave the way for a bookcase, combined with a writing-desk, as an appropriate piece of parlour furniture. Supposing, then, that a ploughman's cottage consisted of two rooms below separated by fixed partitions, and two above, separated in the same manner, the box-beds being no longer necessary, the furniture of the four rooms would be as easily moved as that of the two now is. A great improvement in the condition of ploughmen, both with and without families, who live on farms, would result from their having one common kitchen, wash-house, boiler, oven, washing-machine, mangle, &c., as we have before indicated, § 1333; and when the ploughmen, and other labourers in agricultural districts, become as enlightened as the manufacturing classes, they will feel the necessity of having these things; and, when they do, they will obtain them. We have said nothing of the want of those exterior appendages to cottages which are essential to decency as well as cleanliness, because the evils resulting from the want of them must be sufficiently obvious to every one who has perused the preceding pages of this work.

Design II. — *Two Country Labourers' Cottages, built at Showerdown Braes, on the Beaufront Estate, in Northumberland.*

1339. *The Ploughman's Cottage, in Northumberland,* is every whit as bad as that in the Carse of Gowrie. The plan, fig. 1204, it is to be observed, does not represent two cottages for common ploughmen, but for general day labourers; the exterior appendages, indicated by the dotted lines in the figure, never being added to those built on farmeries, as already observed, § 996. We have given the plan here to show the interior arrangement of these cottages, which we have been enabled to do through the assistance of Mr. John Anderson, many years a respectable Northumbrian farmer. He informs us that box-beds are in general use in the ploughmen's cottages in Northumberland, for the same purposes as in the Scotch cottages; but that, the hovel having only one window, the former can never be so usefully divided as the latter. In fig. 1204, the outer walls of each cottage enclose a space twenty-two feet by

1204



sixteen feet: *a* is the porch inside the house, as in the Carse of Gowrie, and four feet square in the clear; *b* is a space seven feet by four feet, marked in one cottage to show where a bed may be placed lengthwise, so as to face the fire; or two may be placed endwise, and back to back, as in the other cottage at *c*; *d* is a small closet or dairy, four feet square in the clear; *e e* show one mode of placing the beds, by which, the one bed opening to the fireplace, and the other behind, some privacy is obtained for the occupiers of both; *f* is the situation of the dresser; *g*, of the chest of drawers; and *h*, of the press: articles not in use are placed at *b*, and the fuel, generally coal, is kept outside the door, in the open air. A different disposition of two beds is shown in the other cottage at *i i*; as well as that before mentioned at *c c*. The last seems the best of three methods, none of which are good.

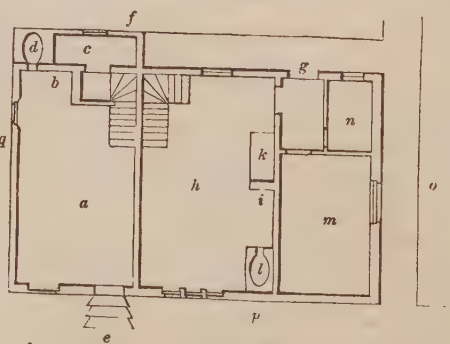
1340. *Remarks.* What we have said respecting the improvement of the Scotch labourer's cottage will equally apply here. The progress of the age requires that there should be a chamber-floor over the living-room, the stair to which might be at *b*, entered by a door from *a*. This would give a lumber closet under the stair, which, with the pantry, or dairy, and the press (the latter ought always to be a fixture, to lessen the inconvenience of removal), would render the living-room commodious, and leave ample space for order and cleanliness; and two bed-rooms up stairs would enable the occupier to keep every thing, in both floors, orderly and comfortable. It is almost needless to observe that the pigsty or poultry-house, *k*, would be a most desirable addition to every ploughman's cottage, as well as *l*; and that *m* should be roofed over. It gives us pleasure to observe one of the first Northumbrian farmers acknowledging the necessity, § 972, of enlarging the accommodation of ploughmen's cottages, by the addition of a chamber-floor. What objection can there possibly be to rendering ploughmen's cottages much more comfortable than they are? The expense first, and the increase of wages which the ploughman would in a short time require, in order to gratify his improved taste, are the obvious answers. But where is the evil of this state of things? It would only diminish the rent of the landlord, who, if he were not content to take less, could become the occupier himself. It may also be said, that it would increase the price of farm produce to the public; but price of every kind depends upon supply and demand. The only question, then, is, what evil would result to society from raising the characters of the ploughman and the country labourer? Every one knows our answer.

Design III. — *Two Ploughmen's Cottages, in a Village near Salisbury, Wiltshire.*

1341. *The genuine English Cottage* has a very different character from either the Northumbrian or the Scotch one. It is undoubtedly constructed less favourably for retaining heat, because in the south that is less wanted; but, being airy and light, it is much more favourable for health and cleanliness. The Design we are about to describe has been sent us as a genuine specimen of a Wiltshire farm labourer's cottage, by a much esteemed correspondent resident in its neighbourhood.

1342. *Accommodation.* The smaller cottage contains one living-room, fig. 1205, *a*, with a fireplace at *b*, a closet under the stairs, and a door out of this closet to the dairy or pantry, *c*; there is an oven from the back of the fireplace, *d*; and the chamber-floor is divided into two rooms. This cottage is entered from the front by three steps at *e*; and it has a garden and orchard of about the eighth of an acre at *f*. The larger cottage is entered behind by one step at *g*, into a porch, as the ground rises from the front to the back: it contains a kitchen, *h*, with a fireplace at *i*; a closet at *k*; another under the stairs; an oven at *l*; a wash-house at *m*; and a pantry at *n*. The space over is divided into one large and two smaller bed-rooms. There are a garden and orchard belonging to this cottage at *o*; and the public road passes on the two sides, *p* and *q*. Fig. 1206 shows the external elevation of the two dwellings.

1205



1343. *Description.* The following observations accompanied the above Design: — "This old double cottage was originally a small farm house. It is built of stone, except the gable, which is of flint and stone in narrow layers: the smaller tenement is more

1206

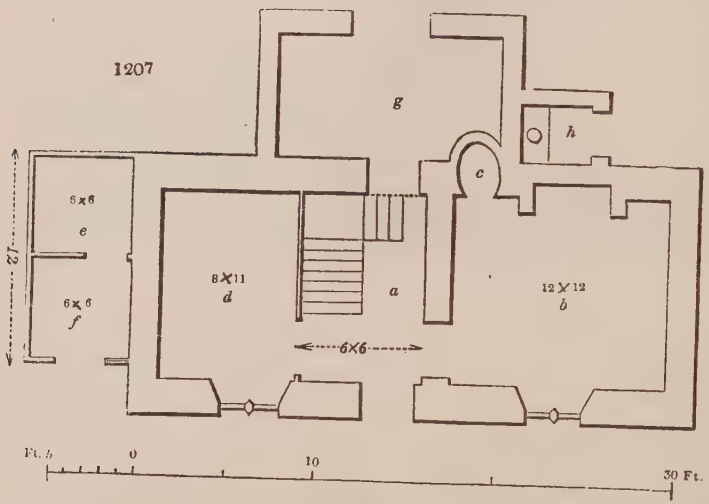
modern than the other. The windows have all stone frames and mullions, except that in the roof; the window with the label over it is a very handsome one. The ground plan is just as it is here represented. The stairs in the larger cottage might be better placed; and the smaller cottage should have a good window, instead of the small one near the fireplace; but they are both comfortable dwellings in summer, though in winter the floors are damp. In the smaller cottage a spring rises close to the fireplace, although the floor is one foot and a half above the general surface. The village is situated in a deep valley, and the subsoil is chalk; consequently there is scarcely a dry house in the parish. The water springs up from the saturated chalk in the cottages, and even in the roads, after much rain or snow; so that on such occasions several of our cottages are not fit to live in. With us, the only remedy for a damp floor is, to dig out the chalk three feet deep, and fill up the vacancy with flints; and even this is scarcely effectual, if there be a spring beneath, or any earth against the outer walls above the level of the floor. A raised platform would, therefore, be useless in such a situation. Indeed, I fancy it is impossible to have a dry house in low situations on chalk; for even our few brick houses are damp; and it is the same in all this district. I do not send this Design as a model for imitation, but merely to illustrate my opinion, that an old cottage, even of the simplest form (especially near freestone quarries), has generally a more pleasing effect, and contains more accommodation, than modern erections of this kind; and this leads me to be an advocate for the old style of building. You will, perhaps, object to the bed-rooms being in the roof. They are not so in all cases; but, when they are, they have generally the advantage of being airy and spacious, though the shape of them is not handsome. They are generally ceiled high up in the roof, so that they are lofty in the centre, and, where the roof is of thatch, such rooms are cool in summer, and warm in winter; and I observe that poor people, who care little for the shape of a room, generally prefer a good bed-room in the roof to one on the ground floor. When I add to the account I have already given of our damp situation, that we are close to water meadows, which are constantly irrigated during six or eight months in the year, you will, perhaps, think this a most unhealthy village. The fact is quite the contrary. We have even very few persons afflicted with rheumatic complaints, and people live here to a great age. With our small population we have few old people; but, of these few, more than half are between eighty and ninety. We have no stagnant water even in the meadows, and the water here is as clear as glass. Still, a damp residence is a nuisance to be remedied, if possible; though this village affords an instance that it is not in all cases prejudicial to health."

1344. *Remarks.* The interior of these cottages, it will be observed, is very different from that of either the Scotch or Northumbrian ones: irregularity and variety characterise the former, as much as plainness and simplicity do the latter. The one gives the idea of the cottage of a serf, and the other of that of a free man. We strongly suspect, however, that the occupants of the former cottages are the happier party; for, from the manner in which they are paid their wages partly in kind, they have always abundance of plain food, and of heat. This may be said of all serfs, of the slaves of the West Indies, and of the feudal vassals of Russia and Hungary. The country labourer of England is in a transition state, between slavery and freedom; in which he has lost the security of the one condition, without having obtained the independence of the other. For this end, he requires a degree of knowledge which has not yet come in his way.

Design IV. — *A roomy Cottage for Farm Labourers, erected in Gloucestershire, on the Estate of William Lawrence, Esq., near Cirencester.*

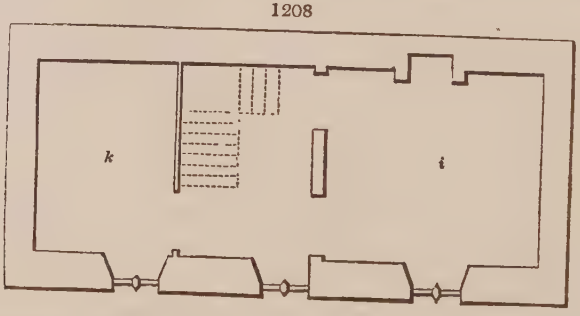
1345. *Accommodation.* There are, in this cottage, an entrance, fig. 1207, *a*, with a staircase down to the cellars and up to the bed-rooms; a living-room, *b*, with an oven,

1207



c; a back-kitchen, or room for washing utensils, &c., *d*; a covered pigsty, *e*; a yard to ditto, *f*; a shed for fuel, *g*; and a privy, *h*. There is a cellar under the passage and cellar stair; and the lobby, and place under the ascending stairs, in the summer season, may serve as a sitting-room. Fig. 1208 is a plan of the chamber story, in which are a

1208

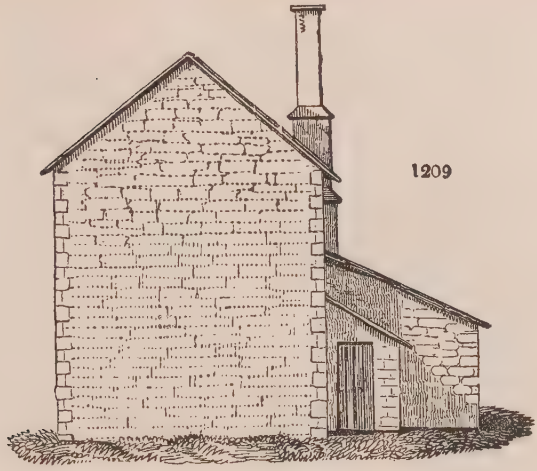


good bed-room with a fireplace, *i*, and another bed-room, *k*. Fig. 1209 is a geometrical elevation of one end, and fig. 1210 a perspective view of the front.

1346. *Construction.* The walls are of the native limestone, two feet thick at the base, tapering to nineteen inches at the wall-plate of the roof; the floors of the living-rooms are boarded, and those of the other places paved with the local flag-stone; the roofs are covered with grey slate.

1347. *Estimate.* The actual cost of this cottage, in the neighbourhood of Cirencester, was £260. As the cubic contents are 14,209 feet, it thus appears that the proper amount for a general estimate, in the given locality, is $4\frac{1}{4}d.$ per foot.

1348. *Remarks.* Such cottages were erected on the estate of the celebrated surgeon, and translator of Blumenbach, William Lawrence, Esq.; a man alike distinguished in his profession for his scientific knowledge, and in the moral and political world for his liberal and enlightened ideas. His estate is under the care of his brother, Charles Lawrence, Esq., who not only possesses great taste in landscape-gardening and ornamental


1209

horticulture, but is a most judicious philanthropist. At our earnest request, he contributed this Design, and that which follows.

1210

Design V. — *A double Cottage, intended for Farm Labourers, in Gloucestershire.*

1349. *Accommodation.* The ground plan, fig. 1211, contains, for each cottage, a living-room, *a*, with oven, *b*; staircase, *c*, down to the cellar and up to the bed-room; back-house, *d*; place for fuel and tools, *e*; pigsty, *f*; and privy, *g*. The chamber-floor, fig. 1212, contains two good-sized bed-rooms, though without fireplaces, *h h*; and a staircase, *i*. Fig. 1213 is a front elevation; fig. 1214, an end elevation; and fig. 1215 a perspective view.

1350. *Descriptive Remarks, and Estimate.* This Design, also sent us by Mr. Charles Lawrence, was intended to be erected on an estate under his management. With these Designs he has sent us the following remarks, with a form of agreement and specification for building them combined. "These cottages will appear to you small; but I can assure you they are deemed magnificent dwellings by the labourers placed in them, who are objects of envy among their brethren. They are extremely pleased with the convenience of them, and especially with the cellar, which enables them to stow away their potatoes, carrots, parsneps, &c., out of the reach of frost or depredation. Such cottages would be commonly let at £5 or £6; but we have let them at 52*s.* per annum; conceiving that, in such cases, the capacity of the tenant to pay is the more fit criterion in assessing the rents for labourers, than the sum of money expended. I saw, about two years ago, various calculations of the expense of living in labourers' families, and of the

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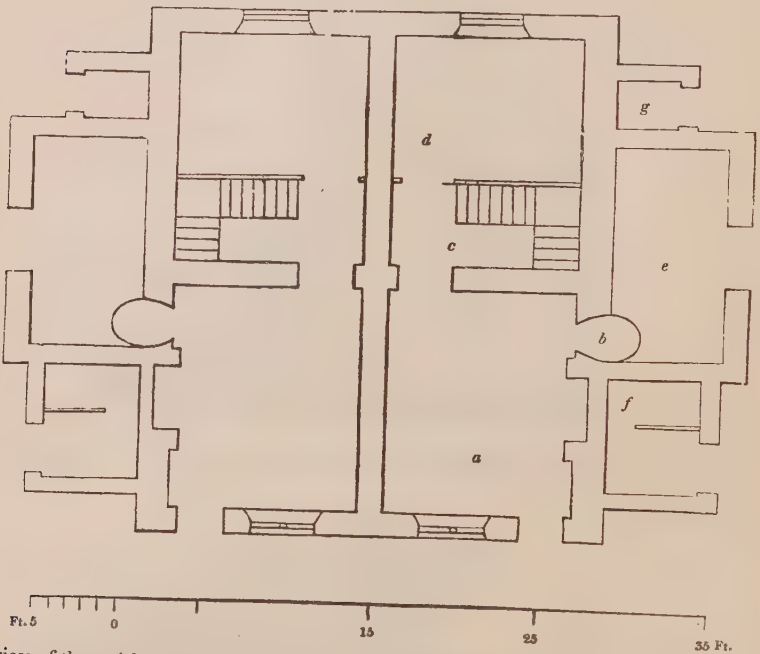
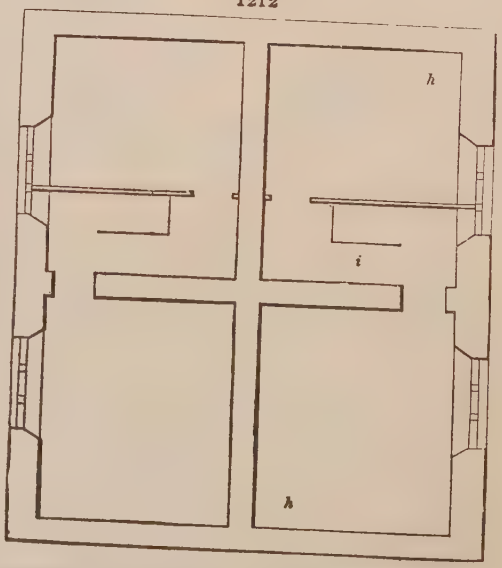


prices of the articles of their consumption; showing that they could not exist on less than wages varying from 15*s.* to 20*s.* per week. This would be a most serious matter if it were true, because there is not the slightest prospect of their obtaining such wages. It is a consolation to know, practically, that a labourer, with a moderate family, not exceeding four children, renting a cottage at 1*s.* per week, and a quarter of an acre of good land at 10*s.* a year, and earning, on an average, by piecework and daywork, 10*s.* a week, can live without parish aid, except in case of illness or accident. I know a man who has brought up seven sons and two daughters, renting a cottage at £4 per annum, and potato land of farmers at the rate of £7 per acre, for which they have not paid their landlords above 25*s.* at the outside; and neither the father nor his children, all of whom are upwards of twenty years of age, have ever received a shilling from any parish. I saw this patriarch, with his seven sons, on three several occasions, give their votes for the city of Gloucester as freemen (they are now disfranchised as non-residents), and I shall not soon forget the indignation they felt at an examination by the agents of the other

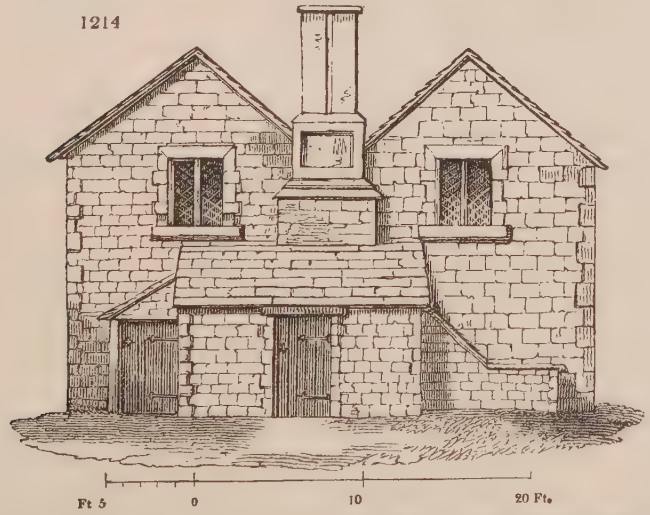
1212



1213

candidate, as to whether they had received parochial relief. Would that this spirit were more generally diffused, and that it were cherished and fostered by the owners of land as

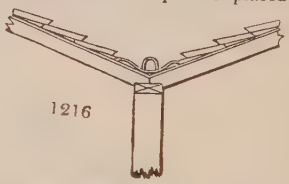
1214



it ought to be! Of the plans I have sent you, fig. 1210, p. 653, has been executed; but fig. 1215, though a more pleasing elevation, was given up, as it involved a lead gutter between the roofs, which increased the expense £10; and, what was a far more serious objection in my mind, it incurred the risk of damage from snow in winter, as you could never rely on a labourer taking the precaution of throwing it off." A simple and effectual remedy for this evil has been pointed out to us by John Robison, Esq., Secretary to the Royal Society of Edinburgh; who says, "A frequent cause of annoyance is the water which finds admittance in roofs when the valleys and gutters get obstructed by melted snow, on the occurrence of a sudden thaw. This is easily and effectually prevented by any contrivance by which a waterway can be preserved in the gutters, into which the snow cannot find access until it be melted: slates, or boards, supported so as to leave a hollow under them; ranges of tiles with their convex sides uppermost; damaged slates, &c., may be applied in this way with perfect success. In towns, many roofs get injured by the persons sent up to throw the snow off them; but if the above simple precaution be taken, the greatest accumulation of snow can do no harm, however rapid the thaw may be." Fig. 1216 shows a valley-gutter between two roofs, with a ridge-tile,

1215

or draining tile, or one of Peake's semicylindrical tiles, placed in it as a drain when the valley is filled with snow. Fig. 1217 is a single gutter with a common pantile placed in it in an inverted position, for the same purpose. It may be observed that these tiles, in summer, will be useful, by protecting the lead from the intense heat of the sun, which in many situations produces cracks, and causes the lead to turn up at the edges. Mr. Lawrence continues:—"With regard to the cost of the two cottages which were executed, fig. 1207, I consider the shortest and the most satisfactory plan will be, to send you a copy of the specification, showing the quantity and quality of the work done for the money. You are aware that, in general, a mere statement that a building cost a given sum is very unsatisfactory, without knowing exactly what the contract comprised; for there is often much subsequent expense not provided for, and the mode in which the building is finished makes all the difference in the cost. In this case you will see the contract provided for every thing, except timber, and cast-iron frames for the windows. The price in the contract was £199. The bill for the cast-iron frames was £9: 15*s*. There being no timber cut sufficiently seasoned, the contractor was to furnish such as might be required, except joists and rafters, which were cut out of larch poles, worth, perhaps, £10 or £12 to sell; and his bill, including shelves, &c., amounted to £40. The entire cost may be estimated at £260. The old cottages need not affect the account; for they furnished nothing in value exceeding that of the labour employed in their removal. The using of cast-iron window frames is a notion of my own. I have for some time got them made by Stothert of Bath, and much prefer them to wood or lead. Where they are used, the stonework should be left somewhat smaller in the opening than the intended size when finished; and it should be worked to its proper size when the frames are ready to be put in, as they are sometimes slightly warped in the casting, and a better and closer fit is thus insured. Design V., fig. 1211, would have cost £10 more than Design IV. In situations where effect is of more consequence than a few pounds more or less, and two cottages are built side by side, according to Design IV., a gable should be thrown up in the centre, to relieve the length of roof: barge-boards may be introduced in these gables, and a rustic porch set round each door, formed by four small trees about six inches in diameter, or of larch poles with the bark on, connected on the sides by the crooked branches of oak, which are found at the barking season to be too rough for stripping."



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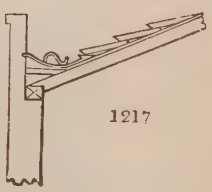


1217

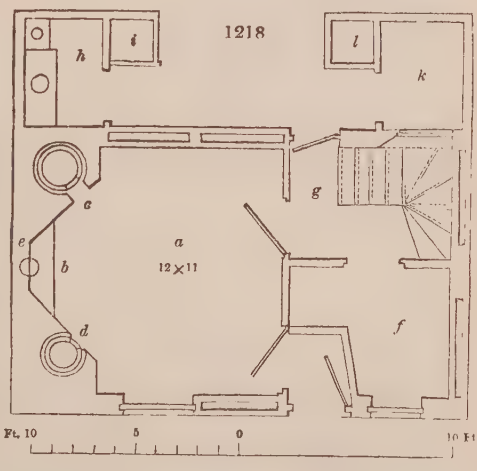
1351. *Specification and Agreement.* To take down the two old cottages, and in the stead thereof to erect, build, and complete for habitation, two new cottages on the site to be fixed on by William Lawrence, Esq., in a substantial and workmanlike manner, according to the following specification; that is to say:—to dig out and form foundations, cellars, and privy vaults, to be walled; to build the two new cottages according to the plans and elevations hereunto annexed, and to provide, at the expense of John Jordan

(the contractor), all necessary hauling and labour, and all materials and workmanship of every description, except timber; the timber to be supplied by the said William Lawrence in the rough, and sawed out and worked up by the said John Jordan (the floors to be furnished in plank); and also the windows, except the cast-iron frames, which are to be found by the said William Lawrence, but to be glazed at the expense of the said John Jordan. The walls to be built in a strong rough manner, with rusticated ashlar coins, the sills to the windows to be of weathered stone. The chimney tops to be formed of weathered stone ashlar, with proper heads and drips. The ovens to be formed of fire-brick with iron stoppers. The floors of the lower rooms and passage (except that of the largest room on the ground floor) to be of good clean close-jointed paving. The floors of the lean-to and privy and pigsty to be laid with common rough paving. The floors of the large room on the ground floor, and of the upper rooms and staircase, to be of elm board, framed and laid in a good manner. All the roofs to be pointed to the pin (mortar to be laid under each course of slate, from their lower edge, to the pin which fastens the slate below). All the doors to be ledged doors, ploughed and tongued, well fitted, and hung on good strong hinges. All the walls of the house and privy to be plastered and troweled down smooth and washed. The walls of the lean-to and pigsty to be pointed; and the walls of the court of the latter to be covered with weather-coping. To provide spouts of wood or cast-iron, and fix them at the front and back of the cottages, and a downright spout to each, to convey the water into a reservoir. All the outside wood and ironwork to be painted with three coats of oil paint. To cover in the said cottages and outbuildings, on or before the 1st of July next; and to complete the same in all respects fit for habitation and use, and to clear away all the rubbish from the new, and the site of the old building, by the 1st of September following, to the satisfaction of the said William Lawrence, or his agent or surveyor.

Design VI. — *A Cottage for a Farm Labourer and his Wife, without Children.*

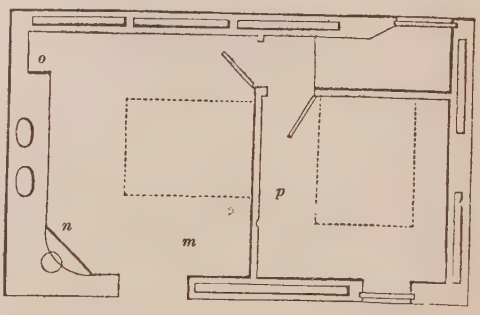
1352. *An Essay on Labourers' Cottages*, by Mr. Tugwell, the celebrated agriculturist, and the inventor of the Beverstone plough, which appeared in the *Bath Society's Papers*, vol. xii., was accompained by two very economical plans for ploughmen's dwellings, which we have thought it useful to copy (with some alterations, which we consider improvements) into this work, as particularly suitable for being erected on farms. We shall commence with that of the smallest size.

1353. *Accommodation.* There are a cellar the entire size of the ground floor, a living-room and pantry over the cellar, and two small bed-rooms over these. Fig. 1218 plan of the ground floor, in which *a* is the living-room twelve feet by eleven feet, with its open fireplace, *b*, oven, *c*, and small boiler, *d*. The open fireplace has the jambs widely splayed, in order to throw as much heat as possible into the room; the flue of this fireplace is circular in the horizontal section, as shown at *e*, and the throat is narrowed, to diminish the draught, as much as is consistent with freedom from smoke. The boiler, *d*, Mr. Tugwell proposes to be a Papin's digester, to enable the occupant to prepare soups, Irish stews, bouillies, &c. from bones which would be otherwise thrown away. The oven, *c*, is supposed to be built of one brick in thickness (two inches and a quarter), both at bottom and sides, and not more than one in breadth (four inches and a half) on the top; the whole to be bedded, and surrounded on all sides, above and below, with four inches of well-rammed wood ashes; these being bad conductors of heat. Mr. Tugwell observes, that he can affirm, from experience, that an oven of this construction will not require more than a third part of the fuel usually consumed in heating. Small-sized earthenware ovens, he observes, are made at the potteries in one entire piece; and these would



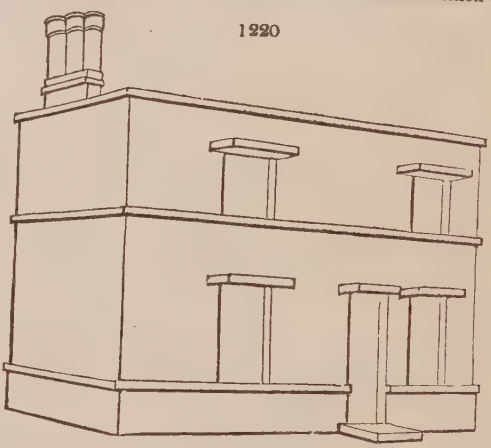
be very suitable for being bedded in ashes. The fireplace of the digester, he recommends to be surrounded by the same non-conducting substance. There are a small pantry, *f*, and a place, *g*, for the stairs down to the cellar, and up to the bed-rooms. Behind are a privy, *h*, a place for ashes, *i*, for fuel, *k*, and for such rubbish as will not convert into manure, *l*. The last four appendages are ours. Fig. 1219 is the plan of the bed-room floor; in which there is a bed-room, *m*, twelve feet by ten feet, with a fireplace and circular flue at *n*, and a recess for shelves at *o*: there is another bed-room, *p*, twelve feet by nine feet. Fig. 1220 is the elevation in perspective.

1219



1354. *Construction.* The outer walls are proposed to be built hollow; either entirely of brick or entirely of stone; or with their outsides of stone of twelve inches in thickness, with an encasing of brick of about six inches, and an interval of six inches between, with cross ties carried up from the bottom to the top. The vacuities in the walls are proposed to be made by means of a hollow light deal box, fig. 1221, three inches in thickness, three feet long, and two feet deep. This box is to be used as a gauge for preserving the vacuities of the proper width: it has two rings in its upper side, by which means it may be easily drawn up to about two thirds of its height; at which height, two catches, fig. 1221, *q q*, at each end, will fly out, by means of weights at their tails, as shown in fig. 1222; and these will hold the gauge box in its proper station, till it may require again to be raised. The width of this cottage being only twelve feet, the roof is made to slope from the front to the back, so as to throw all the water into one gutter, which may convey it to a barrel, tub, or tank, or a cistern over the closet, *k*, in fig. 1218. The elevation of the roof is supposed to be not more than twelve degrees; that slope being most suitable for a covering of Grecian or Italian tiles, figs. 23 and 24, in § 50; or with large slates, fig. 1100, § 1222; cast-iron plates, § 153; corrugated iron, § 420; or with cement, in a manner which will be hereafter described. If intended for common slate, the roof will require to be raised to an angle of thirty-six degrees; if for reeds, hoop chips, or holm (drawn wheat straw), forty-five degrees; and if for common thatch of broken straw, from fifty degrees to fifty-five degrees. The upper wall-plate is proposed to be six inches by two inches; the under wall-plate eight inches by two inches, and the rafters and foot-beams four inches by two inches. The foot-beams are to be considered as ceiling joists, and are to be lathed and plastered: between this ceiling and the roof, Mr. Tugwell proposes to place coal-ashes, as a non-conducting substance; but, if these should not be had in sufficient abundance, hay, straw, moss, chaff, or leaves may be used;

1220



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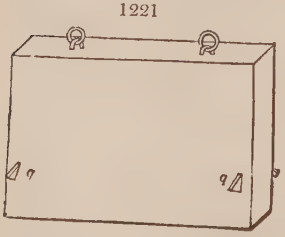

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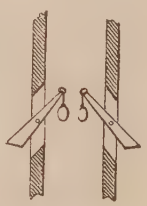
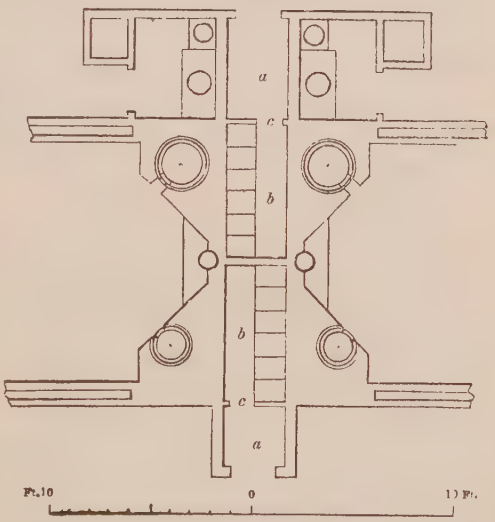


the Dutch and Germans use hay in similar cases. If slates are used, they are proposed to be pointed with a composition of quicklime, sharp sand, and smith's ashes, made into a stiff mortar, with bullock's blood and a little linseed oil, previously mixed over the fire. This mixture, Mr. Tugwell says, should be well beaten together every day, for five or six days successively; and, when used, it should be worked into a soft consistence with lime-water. Small openings for ventilation may be made in the ceilings, close by the chimney flue, and carried up in the wall so near the latter as to be influenced by its heat: all such ventilations should have sliding stops, so as to close them during winter; their chief use being while cooking or baking is going on, during the hot weather of summer. See § 21.

1355. *General Estimate.* Cubic contents, 5,661 feet, which, at 3*d.* per foot, is £70 : 15*s.* : 3*d.*; at 2*d.*, £47 : 3*s.* : 6*d.*; and at 1½*d.*, £35 : 7*s.* · 7½*d.*

1356. *Remarks.* This is a well-considered Design, in point of accommodation and economy. The original elevation, as given in the *Bath Society's Papers*, is without architectural beauty, but we have varied it a little; and also added the appendages, *h*, *i*, *k*, and *l*, behind. Two of these cottages placed together, with a bold stack of chimneys in the centre, would have a good appearance. The blank space in the centre might have a lean-to placed against it, and be subdivided, for the benefit of each house: or a vine or fruit tree might be placed against the wall; or the cottager who could afford it might have there a summer-house or a green-house: the latter would be kept sufficiently warm by the heat from the two digesters or boilers. But the addition which, above all others, we should wish to see made to a single cottage of this kind, would be a thatch-covered lean-to, on the back of the fireplace, fitted up as a forcing-house for poultry; or, where two such cottages were placed together, to see poultry places formed for each cottage between them. Fig. 1223 shows the two ends, or living-rooms, of two such cottages, placed back to back, with two poultry places between. The porch, *a*, to each poultry place, may serve for ducks or geese on the ground floor, and for young fowls to roost over; the ducks being protected from the droppings from the roosts by projecting boards. The laying and hatching places, *b*, may be separated by doors, *c*, eighteen inches wide, from the porches, in order to keep the former warm. Over the passages in the inner places may be roosts for hens expected to lay, and, if it is thought fit, the height may be extended to the roof, and two places for pigeons obtained over the roosting-place for the fowls. If this is not considered desirable, two closets, one to the bed-room of each house, may be formed over the poultry places, and lighted, the one by a window to the front, as shown in the elevation fig. 1224, and the other by a window to the back. In the porches, rabbits may be kept, as well as ducks and geese. It is gratifying to find Mr. Tugwell recommending, besides his excellent oven and digester, "whereby the small quantities of animal food that fall to the farm labourer's share may be rendered solacing, nutritive, and strengthening, large well constructed windows, in order to give light during many hours in the year, that would otherwise require the use of candles." He also recommends a quarter of an acre of garden ground to each cottage; and gives directions for making a kind of stew, in a pot with a cover, a common stewpan, or, by preference, the digester (because this utensil, from its great strength and close cover, admits of raising water to a degree of heat somewhat above the boiling point). This stew is composed of alternate layers of whole potatoes, the refuse parts of mutton, beef, or pork, cut small; and a little thyme from the cottager's garden, together with celery, onions, and savory, either or all; the whole to be seasoned with salt and pepper, and barely covered with

1223



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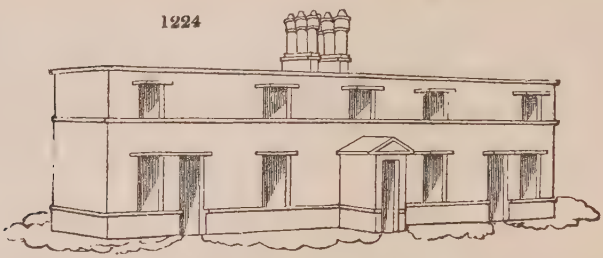
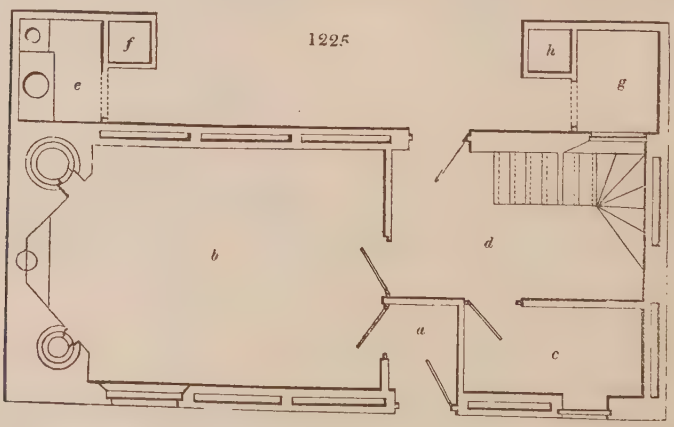


water: the ingredients are then to be simmered till tender, and a few peas, a little rice, or Scotch barley, may also casually be added. "Could the ploughman's wife (equally interested) be only induced to pique herself a little on a knowledge of simple cookery, then, and with other corresponding economy, would the poor but healthful man's life be comparatively a heaven on earth; then, from his daily avocations constantly returning, with the utmost relish, to his healthy and thriving children, would he consider his home as his best and only asylum, and his industrious careful wife his most deserving friend and companion. Then would he partake of enjoyment in his repasts unknown to the most luxurious epicure; and only procurable by the constant toil allotted him as his indispensable portion in life." (*Bath Society's Papers*, vol. xii. p. 372.) We have quoted the above, in the anxious hope that some of our readers will convey Mr. Tugwell's useful instructions to their poor neighbours, who do not know how to make the most of what they already possess. Half the enjoyments of the poor are lost for want of a little knowledge of cookery, which, indeed, ought to be taught them at school, with other female works, agreeably to the German practice.

Design VII.— *A Cottage for a Farm Labourer with several Children; or a Bothy (a Boothie, or little Booth) for three unmarried Ploughmen.*

1357. *Accommodation.* There is a cellar floor for storing roots and fuel, and for keeping milk, beer, or other liquors. The ground floor, fig. 1225, contains an entrance

1225

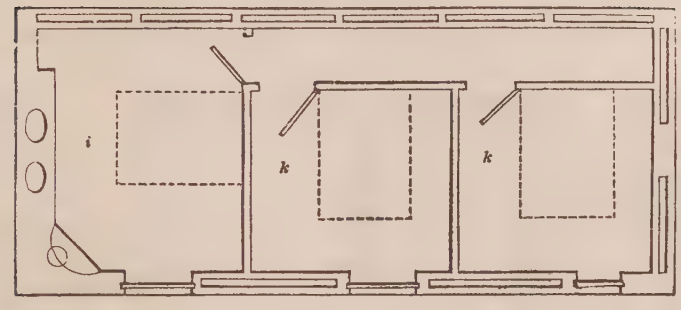


porch, *a*; living-room, *b*, sixteen feet by twelve feet, with fireplace, oven, and boiler, as in fig. 1218; a pantry, *c*; staircase to cellars and bed-room, *d*; privy, *e*; place for ashes, *f*; another for fuel, *g*; and another for refuse not convertible either into fuel or manure, *h*. Fig. 1226 is the bed-room floor, in which are shown, a bed-room, nine feet by twelve feet, with a fireplace, *h*; and two others without fireplaces, *k k*. Fig. 1227 shows the elevation.

1358. *The Construction* of this Design is the same, in all respects, as the last; the difference being confined to length: the breadth and height, and consequently the thickness of the walls, and the details of the roof, are the same as before.

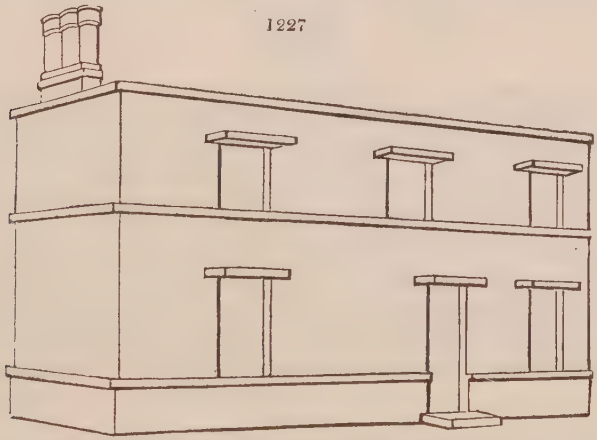
1359. *General Estimate.* Cubic contents, 8,017 feet; which, at 3*d*. per foot, is £100 : 4*s*. 3*d*.; at 2*d*., £66 : 6*s*. 2*d*; and at 1½*d*., £50 · 2*s*. : 1½*d*.

1226



1360. *Remarks.* This may be considered as, on the whole, a very comfortable cottage; more especially if the cellar floor is fitted up with all the conveniences of which it is

1227



susceptible. If the ploughman has a cow, which, in Scotland and in the north of England, is almost always the case, there may be a proper dairy; or, in the south of England, where the great dependence of the occupant of such cottages is upon a pig, there may be a proper salting-place.

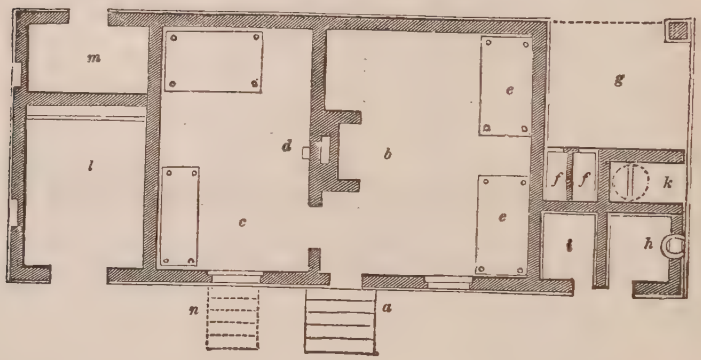
Design VIII. — *The improved Farm Labourer's Cottage of France, as given by Morel-Vindé.*

1361. *The habitations of the country labourers,* Morel-Vindé observes, being of more frequent occurrence than any other, are, on that account, the most important of all; and, notwithstanding the great improvements which this enlightened and benevolent proprietor has made on the other buildings requisite for a farm, those which he has introduced in the cottage of the ploughman he considers the best. In speaking of these, the principles on which Morel-Vindé has constructed his labourers' cottages are thus given. His first condition is, care of the occupant's health, which requires the sleeping-room to be raised above the level of the surrounding soil, with a circulation of air underneath. To fulfil this condition, he raises the floor of his house three feet above the surface, forming a dry cellar under the sleeping-room, which serves as a bakehouse. His second condition is, sufficient space; for which he has given two rooms, one for cooking and living in, and the other for sleeping in. His third condition is heat; for which, in addition to the common kitchen fireplace, and the oven underneath, he has given a stove in the centre of the building. His fourth condition is, economy of fuel; for which he has given a shed for containing it when collected. His fifth is, decency and economy of manure; for which he has given a privy of a particular description. His sixth requisite comprises the cottager's sources of living, in addition to the common wages of labour; for which he gives a cow-house, a place for poultry, another for a pig, another for rabbits, another for

pigeons, and a garden of a quarter of an acre. All these conveniences of the house he has contrived to get within a space of 640 superficial feet, as shown in the details given in figs. 1228 to 1235.

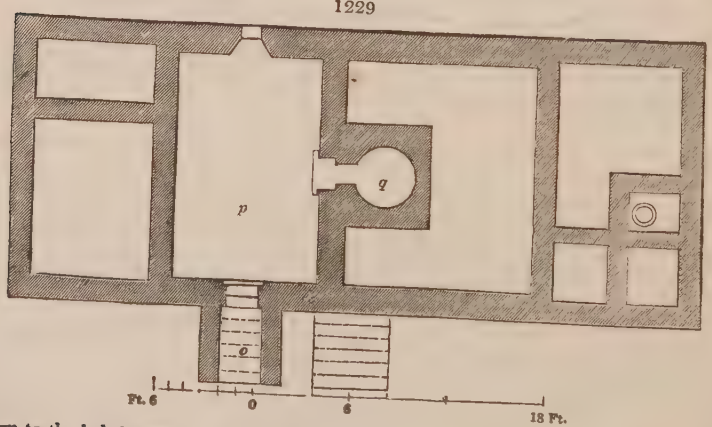
1362. *Details.* In fig. 1228 are seen the ascending steps, *a*, to the living-room, *b*; the

1228



sleeping-room, *c*, with its small iron stove, *d*, and its two beds, the larger for the master and mistress, and the smaller one for the youngest child. The grown-up children are supposed to sleep in the beds, *e e*, in the living-room. The two rabbit places are shown at *f f*; the wood-shed at *g*, the pigsty at *h*, the poultry-house at *i*, the privy at *k*, the cow-house at *l*, the dairy at *m*, and the stair down to the cellar at *n*. It should be remarked, with respect to the poultry place, that it is of the greatest importance to the occupant to keep it warm; and that it might even be worth while (with a view to this end) to have a communication between this and the kitchen, or the oven. Were this done, Morel-Vindé says, the occupant might have hens to lay in the middle of winter; and might rear broods of chickens for sale early in the spring, when they fetch a very high price. Without artificial heat, he says, fowls are no great benefit to a farm labourer, who must necessarily purchase at least a part of their food; but with it they may prove a source of considerable profit, according to the skill of the mistress, and the distance of the market. Fig. 1229 is a plan of the foundations, in which *o* is the stair

1229

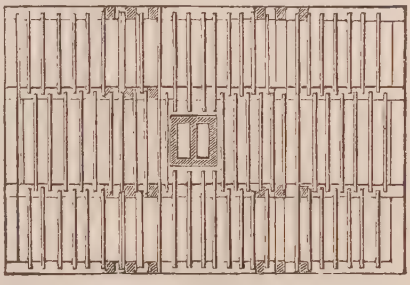


down to the bakehouse; *p*, the bakehouse, and *q*, the oven. Fig. 1230 is a plan of the garret-floor, which forms the ceiling of the two rooms. Fig. 1231 is a front elevation. Fig. 1232 is an end elevation. Fig. 1233 is a cross section. Fig. 1234 is a longitudinal section, in which are seen the oven, *r*; the kitchen fireplace, *s*; the sleeping-room stove, with its funnel, *t*; the garret, entered by a ladder to a door seen in the front elevation, *u*; the level of the wood-shed and pigsty, *v*, and cow-house, *w*. Fig. 1235 is

a perspective view, with some improvement made in the chimney-tops, with a slight porch, and with three panes of glass, shown in the garret-door.

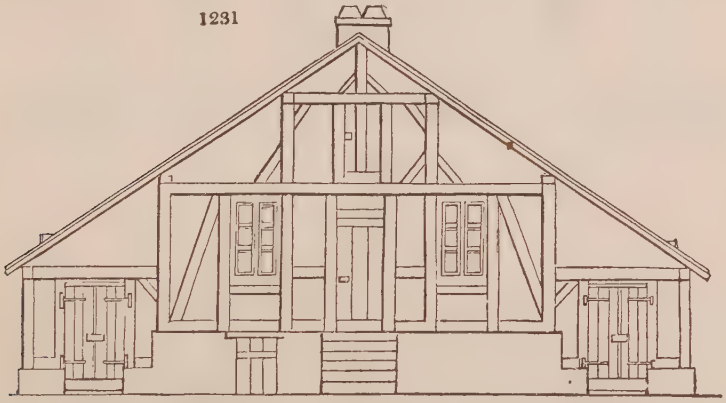
1363. *General Estimate.* The actual cost of this habitation, with its dependencies, in the neighbourhood of Paris, is £160; and the average for the departments, £96. As the cubic contents of the building are 12,852 feet, this gives 2¾*d.* per foot as the price for estimating buildings of this description in the neighbourhood of Paris; and 1¾*d.* per foot for the provinces.

1230



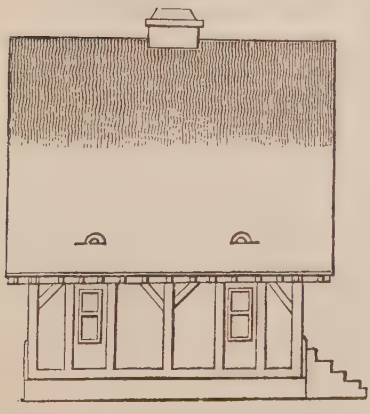
1364. *Remarks.* We cannot sufficiently express our approbation of the generous feelings which induced the author of this Design to bestow so much attention on all its various details. He may be truly said to have done more for the habitation of the farm labourer than all the other French and British Architects put together. Indeed, it has

1231



never formed any part of the business of Architects of eminence, either in France or Britain, to study the improvement of the habitations of the poor; for these obvious

1232



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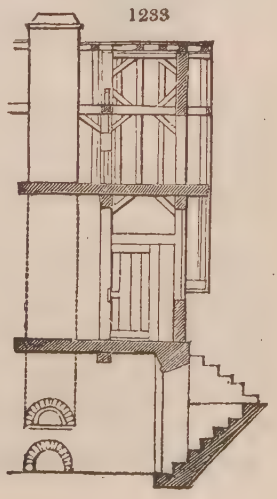

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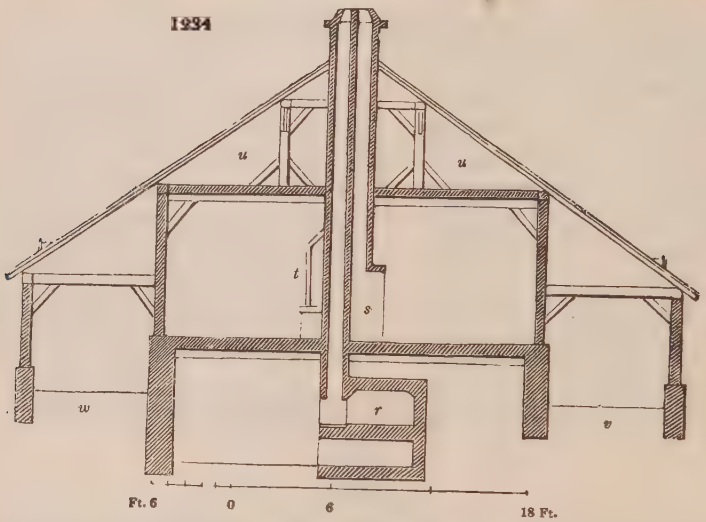


reasons, that the poor cannot pay them, and that the rich, unlike the benevolent Morel-Vindé, care little how the poor on their estates are lodged. In proof of this, we may

1235

refer to the great majority of the cottages of farm labourers in France (which Morel-Vindé informs us are miserable ruins, not only insufficient to keep out the weather, but incommodious and unhealthy), and to the miserable dwellings of the farm servants in the best cultivated districts of Scotland and in Northumberland.

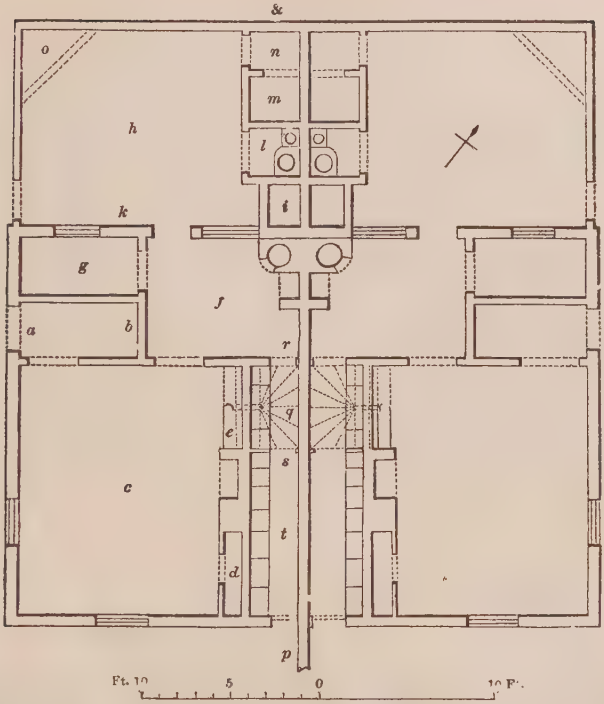
Design IX. — *A double Cottage for Farm Labourers, with places between the Two Dwellings for hatching and fattening Poultry early in the Season.*

1365. *The Object of this Design* is, to show the application of the advice which we have already given, that the wives of cottagers in the country should be encouraged to prepare some article for the public market, as supplementary to the wages of their husband's daily labour, and to supply a motive for exertion, as well as to afford a source of income and a feeling of property, independent of manual labour. Independent cottagers may have recourse to garden produce, useful and ornamental, or the smaller kinds of manufactures, such as lace, strawwork, toys, &c.; but the objects for the farm labourer to attend to, we think, are decidedly poultry, sucking pigs, and rabbits. There is no cottage whatever that may not have a suitable place for these purposes formed in it, or added to it, at very little expense.

1366. *Accommodation.* Each of these cottages contains a porch, *a*, fig. 1236, with a

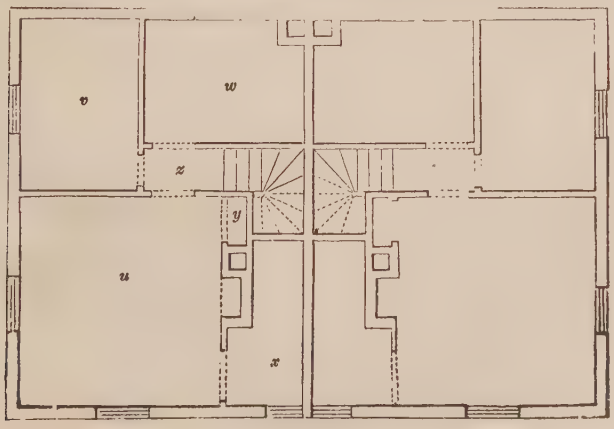
1236

&



place in it for tools or fuel, *b*; a living-room, *c*, with a press, *d*, and stair to the bed-rooms, *e*. There is a back-kitchen, *f*, with a boiler; and, beside it, there may be either an open fireplace or an oven, according to the given locality: there is also a pantry, *g*. The yard behind, *h*, contains a place for fuel, roofed in, *i*; a place for a water-barrel or a pump, *k*; a privy, *l*; pigsty, *m*; a place for ashes, *n*; and for inconvertible refuse, *o*. Behind the living-room fire, and reaching from the front door, *p*, to a door into the back-kitchen, *r*, is a space, three feet wide, separated from the living-room by a four-inch wall, for hatching, rearing, and fattening poultry. The nests are shown on one side of a passage, twenty inches wide; and there is a partition and door at *s*, between the hatching and rearing places, *t* and *q*. The bed-room plan, fig. 1237, contains three bed-rooms, *u*, *v*, and *w*; a light closet, or child's bed-room, over the poultry place, *x*; a press, *y*; and a

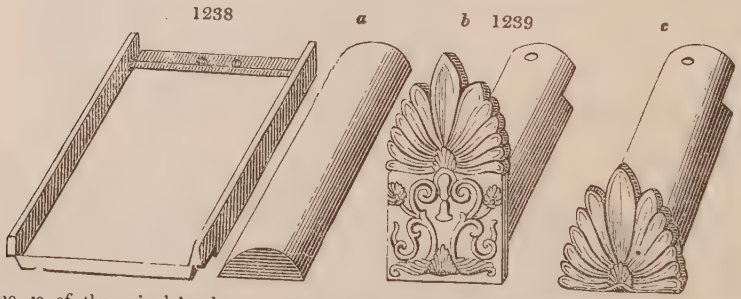
1237

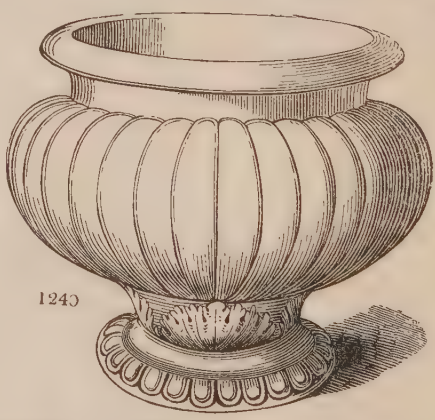


landing from the staircase, *z*. The liquid manure tank from the privy and pigsty is at *&*, in fig. 1236.

1367. *Construction.* The walls are shown as if built of brick, and they are supposed to be hollow, as in Design I. § 25. In this case the partition between the living-room, *c*, and the poultry place is supposed to be of four-inch work, or brick in bed; but if this cottage should be built in a stone country, as the walls will then necessarily be eighteen inches or two feet thick, according to the kind of stones made use of, and as they will be not less thick if built of mud or compressed earth, the partitions in both cases should be of studwork, filled in with brick or clay nogging; the back of the fireplace being formed of a cast-iron plate, through which abundance of heat will pass to the poultry place. If, in the summer time, this heat should be too great, it can be moderated by building, in a temporary manner, stones, brick, turf, or mud, against the back of the cast-iron plate. The outside door of the poultry place being supposed to face the south-east, as indicated in the plan, it would be a saving of heat if the upper part of it were formed of glass, to admit the rays of the sun in spring, with a shutter for putting on at night.

1368. *Remarks.* The plan of this double cottage is commodious. We took the first idea of its arrangement from a plan published in the benevolent Mr. Marriage's *Letters on the Distressed State of the Agricultural Labourers;* but we have added the poultry places, the yard behind and its offices, and altered the situation of the staircase. We have given an elevation in the Italian style, fig. 1241, simply because it would have taught nothing to the young Architect to give a commonplace one. In this elevation, the flat tile, fig. 1238, which is a recent improvement by Mr. Peake, on his flat tile, fig. 24, *a*, § 50, is supposed to be employed; the joints being covered with semicylindrical tiles, like *b*, fig. 24, and the tile at the eaves either terminating in a plain end, as in fig. 1239, *a*; in an ornamented end, like *c*; or in a still more ornamented one, as *b*. In consequence of the raised bead, or water stop, across the upper part of the tile, fig. 1238, roofs to be covered with these tiles need not have a greater slope than an angle of fifteen degrees; an immense saving of timber and other materials, as well as a source of great classical beauty. The tiles, being formed of terro-metallic earth, have somewhat of the colour of cast iron: they are almost equally hard; and must, from their nature, be incomparably more durable. In short, we consider them as the best of all coverings for roofs, whether of small or large buildings, provided the timbers be sufficiently strong to sustain them. On the terrace we have shown vases, which we propose to be of a kind recently manufactured by Mr. Peake in one piece, fig. 1240, two feet high and eighteen inches wide, of great beauty, and remarkably cheap, being formed of the same material as the tiles. There are suitable ridge-tiles, gutter-tiles, valley-tiles, and barge and summer-stone tiles, all manufactured by Mr. Peake in the same superior style, at the same pottery. As the terro-metallic earth is of the greatest durability, Mr. Peake is of





1241

opinion, that flat tiles made with grooves in their edges, such as are shown in the section fig. 1242, for the purpose of admitting a tongue or seam of putty, would completely

1242

keep out the rain; while they would, by rendering the bridge or semicylindrical tile which covers the joint unnecessary, form a lighter roof, and require less strong timbers. It must be confessed, however, that such a roof would not be so beautiful as the other, because it would not recall to the imagination Italian, Moorish, or classical forms. While recommending classical tiles, and other ornamental objects for labourers' cottages, it will never, we trust, for a moment be supposed that we consider such appendages as at all essential to them, or mean to put them, in the slightest degree, in competition with arrangements for insuring commodiousness, warmth, convenience, or cleanliness. Nevertheless, we are not without an object in introducing exterior ornaments, and even in being profuse in their introduction. That object is, to tempt the higher classes to erect comfortable cottages, for the sake of their ornamental effect. Now, though, in our opinion, a plain cottage, with every comfort belonging to such a dwelling, is perfectly beautiful in itself, without the aid of exterior ornament; yet this is by no means the case with those who judge only by the outward appearance, who, probably, never entered a cottage in their lives, who have little sympathy with its occupants; and who, therefore, are unfit to appreciate the beauty of fitness. Classical and picturesque ornaments are within the range of what is allowed to be beautiful by such persons, and they like to display such evidences of their taste for beauty on their estates, without caring for, or without having at all taken into consideration, the interiors of the buildings they thus decorate. What has led to the small degree of improvement that has been made in the lodges, gardener's and bailiff's houses, and the houses of other servants, on gentlemen's estates? The comfort of the occupants? By no means: it is simply the desire of producing objects that will be ornamental in the landscape; and the convenience of the interior is seldom, if ever, thought of, even by the Architect. To be convinced of this, it is only necessary to enter the houses alluded to, or to examine the works on the subject, published by professed Architects. We admit that there are honourable exceptions, but they are very few. The Highland Society of Scotland lately offered a premium for the best design for a labourer's cottage; and, though there were a number of competitors, we are informed by a correspondent, that the designs were so indifferent, that none of them were considered worthy of the premium: "none contained any thing beyond the usual routine; not one showed a floor above the level of the soil they stood on; most of them had their chimneys in the external walls; and scarcely any attention had been paid in any of them to certain appendages, on which the comfort and cleanliness of every family must, in a great measure, depend." "How can we find fault," our correspondent asks, "with the Scottish peasantry for not being neat and cleanly in their habits, if those who build their dwellings do not encourage their amendment by furnishing facilities for it?'

Sect. VI. *Of the Exterior and Interior Finishing, and the Fittings-up and Furniture, of Farm Houses and Farmeries.*

1369. *The Exterior and Interior Finishing* of the dwellings of farmers differ little from those of other houses; and, as we have already entered at some length into the subject, when treating of cottages, our observations in this section will necessarily be few. The finishing of farmeries differs considerably from that of dwellings, though, being necessarily of a very inferior description, it will not require a lengthened discussion. Nearly the same observations will apply to the fittings-up of both classes of buildings.

1370. *The Furnishing of Farm Houses* includes some articles peculiar to the kitchen court; and that of the farmeries comprehends a variety of machines, implements, instruments, and utensils; but most of these are so much more intimately connected with agriculture than Architecture, that we intend only to notice them in so far as they influence the form, size, or disposition of the building or apartment in which they are to be contained. We consider it essentially necessary to do this, on the principle already repeatedly laid down; viz., that to design a building, or any part of it, in the fittest manner to answer the end in view, it is necessary to know what that end is. At the same time, we shall be careful, in this work, not to repeat any thing that has already appeared in our *Encyclopædia of Agriculture*. We shall include the finishing, fittings-up, and furniture of the farm house and kitchen court in the same subsection; and we shall devote another subsection to the finishing, fittings-up, and furniture of the farmery.

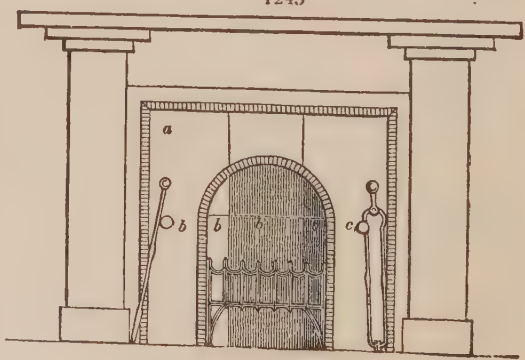
Subsect. 1. *Of the Finishing, Fittings-up, and Furniture of the Farm House, and the Offices of the Kitchen Court.*

1371. *Generally the Finishing and Furniture of the Living-Rooms of Farm Houses* ought to be substantial, and rather plain than highly ornamented: because the occupation of the farmer is less delicate and refined than that of the followers of most other trades and professions; by whom a highly finished and elegantly furnished house would be less likely to be soiled or injured, than by the thick and earth-stained shoes of the working farmer. Be it observed, however, that the mind of the farmer, and also his manners, may be as high in the scale as those of the others; and, of course, the wealthy farmer may have his drawing-room as highly finished, and richly furnished, as the independent landowner.

1372. *Recesses for Cupboards, Closets, and Pantries* ought to be more numerous in farm houses than in dwelling-houses near towns or villages; because the farm must generally be considered as situated at some distance from either, and consequently a greater quantity of groceries, and other stores purchased in shops, will be required to be kept in the house. The fittings-up of these recesses, &c., must be regulated by the uses to which they are to be applied. In general, open shelves are much better than drawers, as being easier got at, and cleaned; exposing more readily their contents, so as to save time in looking out for articles; and ventilating them better. Shelves, for dresses or numerous small articles, may be formed like trays, to draw out; those for the finer articles of dress should have close fronts like drawers, or drawers in this case may be substituted for trays. The backs of recesses in outside walls should always be lined with boards kept an inch at least from the wall, with an opening the whole breadth of the recess at bottom, and another of the same size at top, to admit of free ventilation.

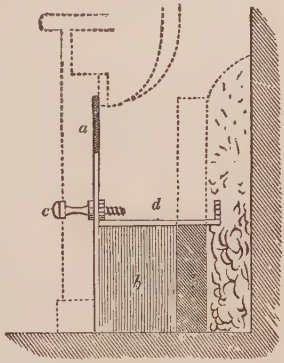
1373. *A very suitable Parlour Fireplace* for farm houses has been sent us by a philosophic domestic economist of Edinburgh, which he adopted some years ago in his own house, except in the large public rooms. It is nearly allied to our figs. 533 and 535, in § 599 and § 600; and has answered so well, that the pattern has been adopted in the Edinburgh founderies, and is made there for general use. The general appearance is as at fig. 1243; in which *a* is a cast-iron plate, either as it comes from the mould, or ground and inlaid, according as it is intended for a principal or secondary chamber; *b b b*

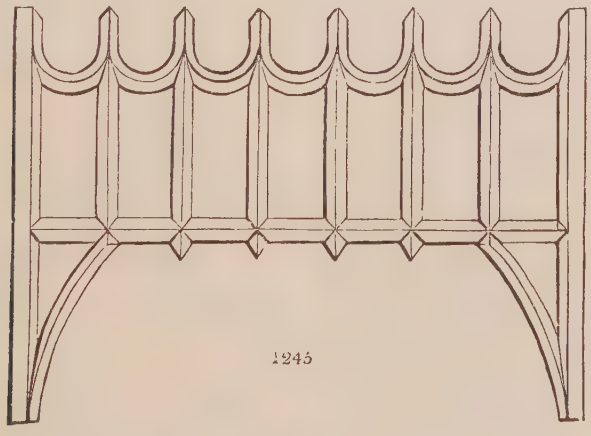
1243



are three large fire-bricks, or Welsh lumps, which reach up to the horizontal line at *c*. The fire-grate may be lifted out to be cleaned; and, as all the patterns of the grates are alike, a single spare one is sufficient to avoid the necessity of cleaning them within the rooms. The peculiarities of this grate are as follows:—First, the bars of the grate are principally vertical; both these bars and the horizontal ones present their angles, and not their sides, to the front; consequently, there is no surface on which ashes can rest, and the appearance of the grate is always clean and neat: secondly, the whole fabric is very firm, and easily set up. The three fire-bricks or lumps, *b b b*, are first set up, and filled in solid behind as high as the dotted line in fig. 1243. The front plate, *a*, is then put in its place, having two roughly forged pieces of iron, *d*, attached to it by the screwed knobs, *c c*; the building is then carried on till the pieces of iron, *d*, are embedded in the brickwork, which is allowed to set; after which, by unscrewing the knobs, *c c*, the plate *a* is again removed, and free access obtained to finish the building. This is rendered more obvious by the section across the fireplace, fig. 1244, in which the same parts are designated by the same letters as in fig. 1243. These fireplaces, in their simplest form, are very cheap, and yet they are very handsome; but with some additional expense they may be made suitable to the most highly finished apartments. They are economical, both from the small quantity of fuel required to warm the apartments, and from the unusually small portion of dust which they throw out into the rooms, or on the furniture. A grate, eighteen inches wide in front, nine inches high, ten inches from front to back, and one foot wide at the back, fig. 1245, burning good splint or Newcastle coal, is sufficient to keep a room

1244





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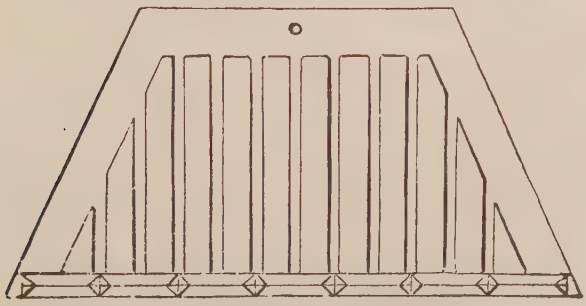
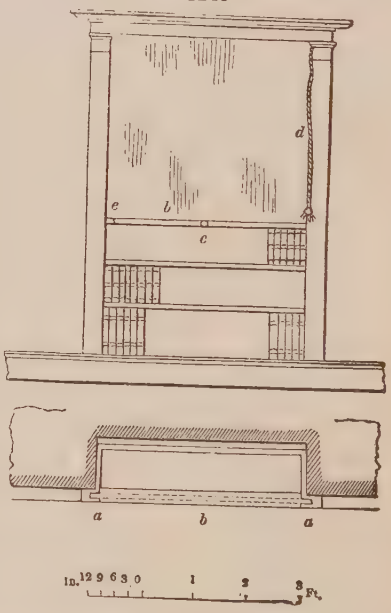


containing 6000 cubic feet of air at a comfortable temperature, during the most severe weather of an Edinburgh winter. The same excellent correspondent observes, that a convenient improvement in register grates with polished bars is, to have the fronts of the grates made to lift off, so as to allow them to be taken out of the room to be cleaned. When several grates of the same pattern are in the same house, a spare front may be hooked on, when the blackened one is taken away; and this, in its turn, when polished, may be used as a spare one in another room. As much of the light dust which lodges upon furniture arises from the stirring of the fire, this may be in a great measure prevented, in register grates, by having a horizontal slit, or row of holes made through the back plate, just under the grate bottom: as a current of air will always be flowing by such openings into the space between the back plate and the wall, the light dust which is separated by stirring the fire will be carried in by this current, instead of partly eddying out into the room.

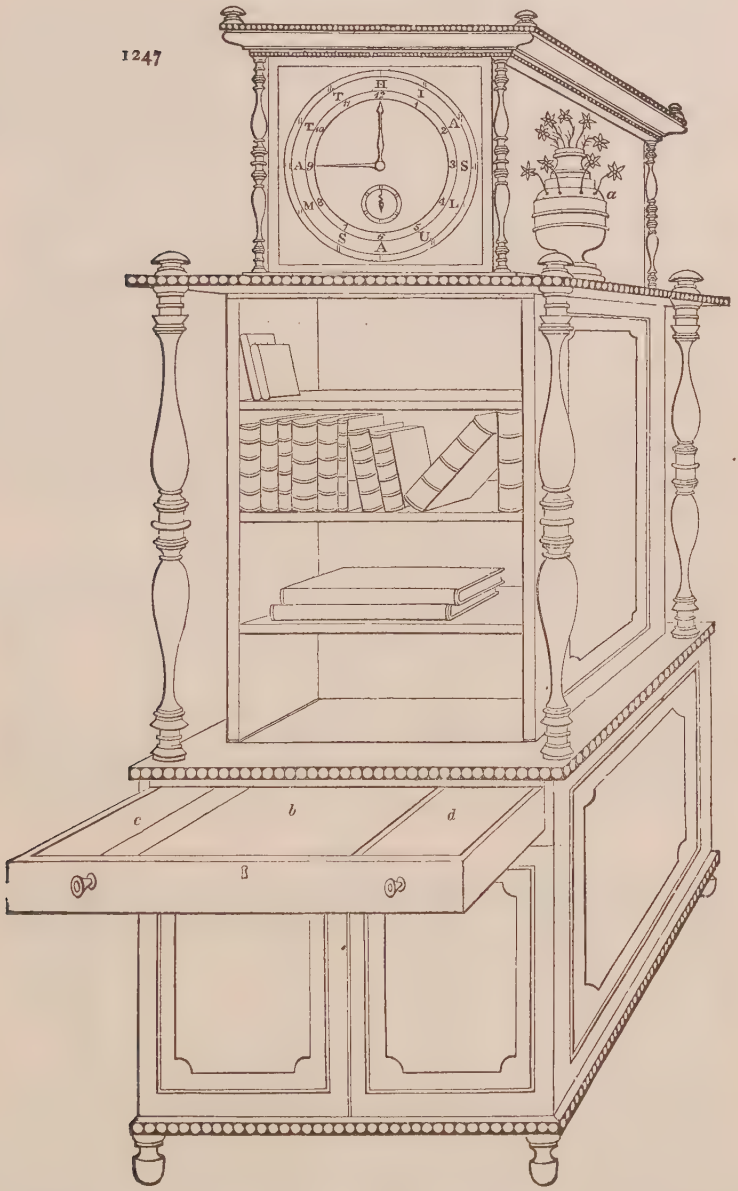
1374. *The Furniture for the Living and Sleeping Rooms of a Farm House* have nothing in them which is peculiar; and therefore we refer our readers to what we have said respecting the furniture of cottages, for farm houses of the smaller size; and to what we shall say of the furniture of villas, for those of a larger description. As all educated persons living in the country must necessarily derive a considerable portion of their enjoyment from books, the parlour of the farmer ought always to be provided either with a large bookcase, or, for economy's sake, with one or more recesses in an interior wall or partition, fitted up with book-shelves. In either case, where glass, or glazed bookcase doors are considered too expensive, we would recommend a blind of canvass working in two grooves, as an equally efficacious protection for the books. This is the invention of a very ingenious architect, Charles Vokins, Esq., who has adopted it in his office bookcase. In the styles or sides of the frame of the shelves, fig. 1246, *a a* are the grooves, and *b b* the laths to which the canvass is attached, which work in them. The blind thus formed being pulled down by the knob *c*, and pulled up by the cord *d*, the last operating on a spring roller, enclosed in a tin case fixed in the top of the bookcase; *e* is the scutcheon of a lock in the lath, for locking up the whole or any number of shelves. The book-shelves, where economy is the main object, may be fixed; but where they are movable, and supported by pins, we would recommend another improvement, invented also by Mr. Vokins. This is, having the pins of metal broad and flat, so as to fit into grooves in the under sides of the shelves; by which means two more books are got upon each shelf than it would otherwise hold, without raising it the thickness of the pin above the height of the books, which would thus lose a space of an inch or more the whole length of the shelves. Two flush brass bolts in each shelf would effect the same object, but in a more expensive manner.

1246



1375. *Saul's Bookcase and Writing-desk Clock* forms a curious and useful piece of furniture for the farm-house parlour. This clock, fig. 1247, Mr. Saul observes, "differs from any I have seen; and may, at first sight, appear expensive: but this is by no means the case; for there are few mouldings about it, beads looking equally well, and being much cheaper. Long before I made this piece of furniture, I always considered the common clockcases defective, from the room taken up by them, when compared with the very small space occupied by the works of the clock; and I therefore endeavoured to make every part of use. In describing this clock, I may commence with the face. As my name has twelve letters in it, I have placed them on the clock face, instead of the figures which denote the hours; the figures in the inner rim represent the hours also; but those on the outer rim are on an entirely new plan. Those to the left of six o'clock, and twelve o'clock, representing how many minutes it is to such an hour, and those to

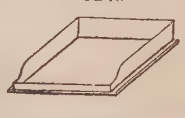
1247



the right representing how many minutes it is past such an hour. This arrangement will be more easily understood by looking at the face of the clock in the drawing, than by any description. I think it particularly useful for farm servants, and such sort of people, in the country; many of whom I have known, who could not tell the minutes otherwise than by guess. At the angles of the face I have the four seasons painted, and on each side I have an urn lined with lead, in which I can put water for keeping cut flowers. The upper part, *a*, of this urn, takes off, to admit of changing the water and arranging the flowers. Under the head of the clock I have shelves fixed for books, as the pendulum

and weights only occupy a space of seven inches square, which I have enclosed as a trunk or case, so that the books can be removed without ever interfering with the working of the clock. Being an eight-day clock, it only requires the lines of the weights to be two feet ten inches long; so that I have the whole of the lower part of the stand for drawers or whatever I choose. This lower part I have fitted up with a writing-desk in a drawer, with a slider *b*, for writing upon, which moves from *c* to *d*, and from which you have received many a letter. Under this writing-drawer I have two doors, which enclose three sliders or trays, like fig. 1248, which I use for keeping paper in. When I am writing, I keep the doors open, as I find this more convenient for drawing out the sliders, and referring to the papers they contain." This piece of furniture, which we have taken the liberty of calling Saul's Bookcase and Writing-desk Clock, and for which, Mr. Saul being a cabinet-maker and joiner, we could wish he had 10,000 orders, is seven feet high, in three divisions. The lower division is two feet four inches high, by three feet wide, and two feet deep from front to back; the middle or bookcase division, is two feet ten inches high by two feet wide, and the top is twenty-two inches high by twenty inches wide. The diameter of the large turned baluster is three inches in the widest part; and that of the small balusters is two inches in the widest part. The shelves are sufficient for containing a select agricultural library, and the writing-desk below, with slides for papers, must be amply sufficient for the correspondence and accounts of any ordinary farmer.

1248



1376. *The Introduction of Iron into the Furniture of Farm Houses* would be attended with considerable economy, at least in the article of dining-tables, sideboards, bedsteads, and hall, lobby, or porch chairs. The sideboards may be formed of slabs of native marble in some districts, and slate in others, supported by enriched cast-iron feet, fig. 1249, or by brackets of various kinds, fig. 1250. Sideboards of this kind have a massive architectural effect, very suitable for all houses whatever, and especially for houses in the country, where room is not an object. For our own part, we should even prefer slabs of finely polished stone, as sideboards, to wood of any kind; but cast iron may be substituted; and, where neither metal nor stone is approved of, wood of some kind is always to be obtained, and may be worked and polished at pleasure. Fig. 1251 is a circular table, the top of which may be made of mahogany, or any other finely grained wood, and the supports of cast iron bronzed. The idea of having iron bedsteads will, we have no doubt, shock those who have been always accustomed to consider mahogany as essential for this piece

1249

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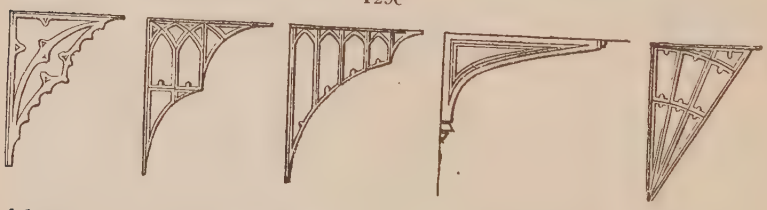
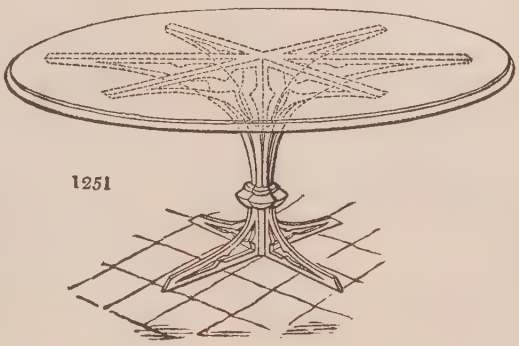


of furniture: but we can assure them that they are to be found in the houses of people of wealth and fashion in London; sometimes even for best beds.

1377. *The Kitchen of the Farm House* requires a good kitchen range or grate, which should always be accompanied by a boiler on one side, to afford a constant supply of hot water; and an oven on the other, for baking, or keeping things hot. Both should be heated by the same fire. There are numerous cast-iron kitchen grates with a boiler on one side and at the back, and an oven on the other side; and we have already (§ 592) figured and described what we consider one of the simplest and best. For a farm house it should generally be on a larger scale than for a cottage; and the most abundant choice may be obtained at the shops of the ironmongers in every part of Britain. In Derbyshire there are square cast-iron boxes, with iron or stone lids built in, at the sides of the kitchen fireplaces of farmeries; and Mr. Farey, in his elaborate, accurate, and most philosophical report of the county, informs us that they have been found great sources of usefulness and comfort, in supplying abundance of hot water at all times.

In Northumberland and Berwickshire, the kitchen fireplaces are fitted up in a very economical manner, so as to supersede, in many cases, the necessity of having a back-kitchen; a plan, however, not favourable to cleanliness, essential requisites for which are space and separation. The jambs or sides of the fuel-chamber are built of a kind of stone which resists fire, or of fire-brick. One cast-iron grating, fig. 1252, is built in as a bottom, and another grating, fig. 1253, is let into the stone at both ends as a front. On one side in the masonry is built in a cylindrical cast-iron oven, seen in fig. 1254; and in the other is built an open boiler, generally, also, of cast iron, with a wooden cover, and separated from the fuel-chamber by an upright plate of stone or iron, coved behind, and



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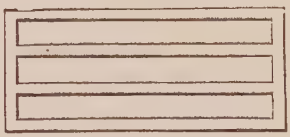
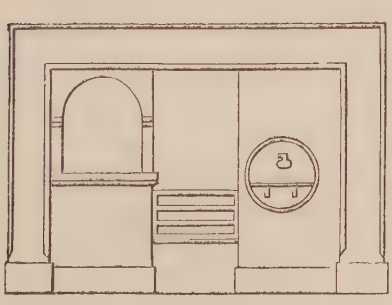


arched over at top, as shown in the figure. Beneath the oven, and beneath and around the boiler or pot, as it is called in those counties, flues are formed opening from the fuel-chamber, as shown in the section, fig. 1255, in which *a* is the opening or commence-

1254



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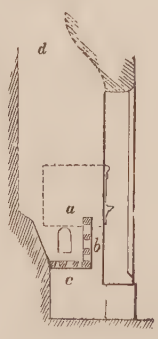
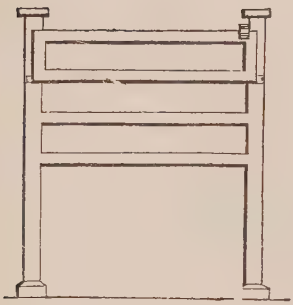


ment of the flue of the oven; *b*, the front grate; *c*, the bottom grate; and *d*, the throat of the chimney. This forms the cheapest description of efficient kitchen range that we know of for a farm house; and, for a country where the fuel is coal, and abundant, it answers every purpose. A somewhat better kitchen range is formed by employing what is called a standard grate, fig. 1256, the upper bar of which lets down at pleasure by lifting up the catch, *e*, in fig. 1257. In this section, *f* is the bottom grate let into the stone at *g*; *h*, the flue of the oven or boiler; and *i*, the tie bar of the standard grate, which, being let into the stone at *k*, keeps it from falling forward. There are cast-iron kitchen grates suitable for farm houses, manufactured in large quantities at the Shotts iron

1256



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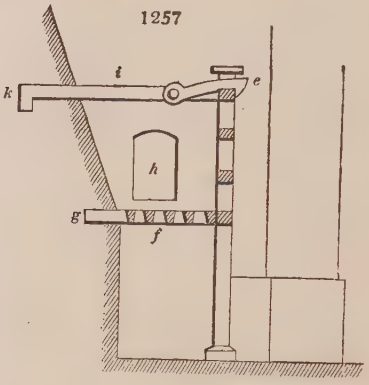
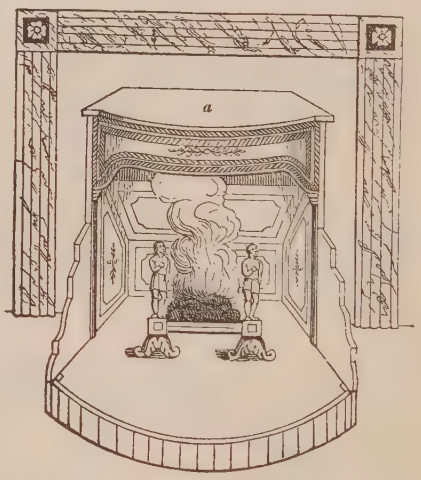


works, at Whitburn, near Glasgow, and sold there at various prices, from 30*s.* to 90*s.* by retail. Where timber is the principal fuel, there is no stove better adapted for throwing out heat than the American stove, fig. 1258; but it is not so well adapted for cooking as the British cast-iron ranges. It might, however, be much improved in this respect, by having the projecting shelf or cap, *a*, hinged, so as to lift up; and by having a hook fixed in its underside, from which a pot might be suspended. Where stoves of this kind are used, the oven and boiler are necessarily built apart from the open fire, and heated separately; though it would be an easy matter to connect with this stove both an oven for baking, and a square cistern for heating water, either for the purposes of cookery, or cleaning, or for circulation to heat some other apartment, or to hatch eggs, or keep warm a poultry place. Great benefits have been experienced from the introduction of the American stove into some farm houses in Kent; where, from the large open chimneys, it was before their introduction found impossible to keep the kitchen, which is there generally the farmer's living-room, comfortably warm. Such kitchens were only rendered habitable by elderly people, in consequence of the use of the large chair or settle, fig. 636. When anthracite or blind coal is the principal fuel, Hinton's American cooking-stove, figured and described in the *Mechanics' Magazine*, vol. xiv. p. 273., may be employed. In all cases where wood is the principal fuel, we believe it will be found decidedly the most economical method to heat the air of the kitchen, as well as the living-rooms, by stoves, as in Germany; by benches of flues, as in China; or, better still, by underground flues, or steam-pipes under the floor, to heat a mass of masonry, as we have before proposed; and to make the fires used in cookery on raised hearths.

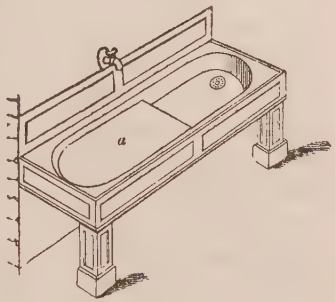
1258



1378. *The Back-Kitchen or Scullery* of the farm house should always be fitted up with a large sink for dirty water, with a trap and drain communicating with the liquid manure tank; and in many cases it may be found worth while to have a second sink communicating with the tank for pig's food. There are excellent sinks formed of cast iron; sometimes also they are formed of wood, and covered with lead; but most generally they are hewn out of stone; and this kind, as the most durable and the simplest, we think the best adapted for farm houses. Cast-iron sinks are, however, very much used; and some excellent forms have been sent us by Mr. Mallet, who has made great numbers of them. We shall here give fig. 1259, which may serve as a pattern either for a stone or

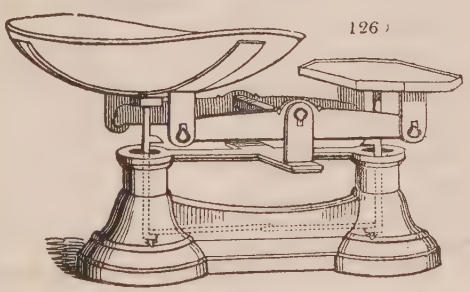
iron sink, or one of wood covered with lead. The sloping plate, *a*, which ought to be grooved, is found particularly useful for draining the water from vegetables, fish, &c., and should never be omitted in any kitchen sink.

1259



1379. *Among the Furniture of the Store-room* of a farm house, there ought to be proper weighing and measuring machines, for proving the weight or measure of articles purchased. One of the most ingenious and generally applicable weighing-machines is the farm and family steelyard, invented by Mr. Ruthven of Edinburgh. It may be made to any size, so as to weigh either a pound or a ton; and only one weight is necessary, its power being increased or diminished by the weight used being moved along a lever. (See *Encyc. of Agr.*, 2d edit. § 2570, fig. 280.) Fig. 1260 is a weighing-machine, for either grocery goods, bread, butcher's meat, or any similar articles, which, though it is not so extensively useful as the other, yet is more simple; and, occasioning very little trouble, and not being liable to go out of repair, is well adapted for general use. The dial weighing-machine, also, occasions very little trouble; but, as its accuracy depends on the elasticity of the iron spring continuing always the same, it cannot, we think, be so durable an instrument as either of the two above mentioned.

1260



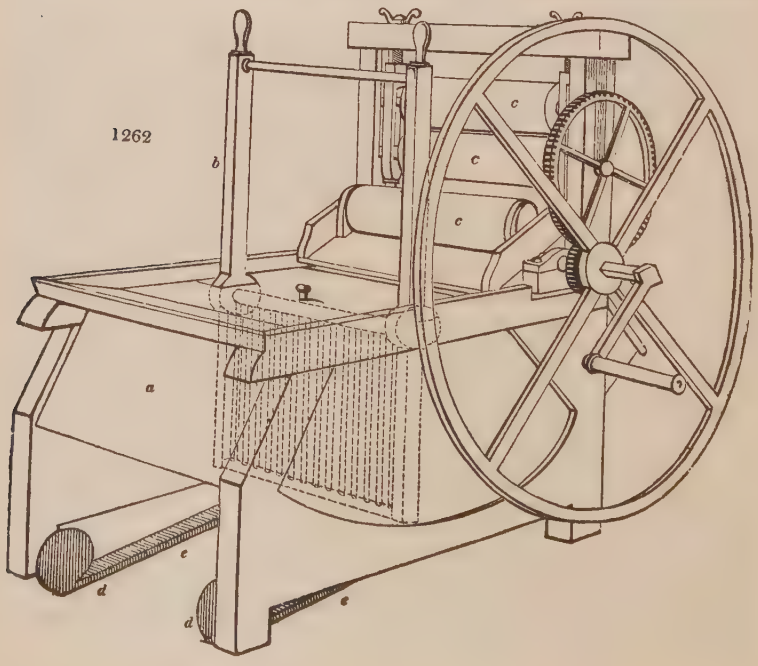
1380. *The Fittings-up and Furnishing of the Dairy* have been noticed § 729. The dairy furniture consists of the churn, of which there is a great variety of kinds; but the cheapest and best, on a very small scale, is the box-churn (*Encyc. of Agr.*, 2d edit. fig. 1214), already recommended for cottages. For a dairy on a large scale, there are several excellent sorts figured in the same work, which may either be impelled by manual labour or by machinery. There is a model of one, worked by a windmill, in the museum of the Highland Society of Scotland; and there is also a model, in the same museum, of a double churn, to be worked by manual power applied to a pendulum, the invention of Mr. Vallance of Libberton, Lanarkshire, an engineer ever fertile in expedients, and the author of many valuable inventions. Of cheese-presses there are many excellent ones; there is one of cast-iron manufactured at the Shotts ironworks, in which the pressure is produced by a combination of a wheel and pinion with a lever and weight, and the cost of which is only 65*s.* This press, fig. 1261, is used in the dairy of Mr. Ogilvie of Mere (see Design XXXVII. § 1153), who informs us that his dairy-maid had a strong prejudice against it at first, but that before she had used it for three months, she greatly preferred it to the old-fashioned box-press or stone press; as she could with this new press regulate the pressure to the greatest nicety, and with the greatest ease, by means of the weight on the lever, which is capable of communicating a pressure of from one ton and a half to two tons and a half. A swing frame for turning cheeses has lately been invented by Mr. Blurtan, and is described in vol. xlviii. of the *Transactions of the Society of Arts*, p. 19 It may be described as a double shelf which turns on pivots, by which means the cheeses are not only turned but placed on new surfaces. There are various descriptions of milk-pans, of wood, earthenware, and metal; but the cheapest and best, we believe, are those of cast iron, invented by Mr John Baird, manager of the Shott's ironworks. These pans or dishes cost from 1*s.* 6*d.* to 8*s.* 6*d.* each, according to their sizes, which are from one quart to ten gallons. Their shapes are either circular or oval; the largest circle being twenty-one inches and a quarter in diameter. This gives the maximum of width for dairy shelves; but square pans, by covering every part of the surface of the shelf, are the most economical. Milk-pans have been formed of zinc, and these are said to throw up cream better than pans formed of

any other material. Zinc, however, is one of those metals which are most readily acted on by acids; and all the soluble salts so formed are poisonous. Zinc, therefore, is a dangerous metal to introduce into a dairy. A thermometer should be placed in every dairy, and the dairy-maid should be taught to regulate the temperature according to some fixed principle. It has been found, by experiments made at the instance of the Highland Society of Scotland, "that the most proper temperature at which to commence the operation of churning butter is from 50° to 55°, and that at no time in the operation ought it to exceed 65°; while, on the contrary, if at any time the cream should be under 50° in temperature, the labour will be much increased, without any proportionate advantage being obtained; and a temperature of a higher rate than 65° will be injurious to the quality as well as the quantity of the butter." (*Highland Soc. Trans.*)

1261

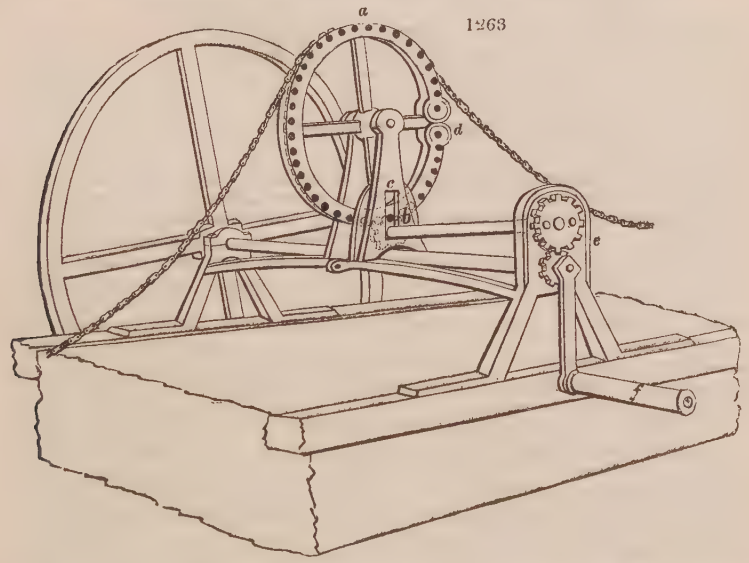
1381. *Among the Furniture for the Wash-house* we would strongly recommend an improved washing and wringing machine, fig. 1262, as calculated to save a great deal of

1262

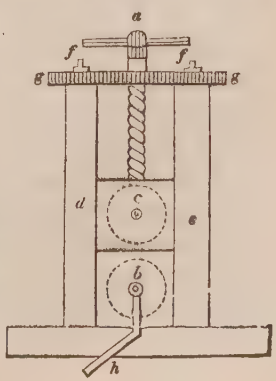


severe labour. In this machine, *a* is the box containing the water and the clothes to be washed by the movement backwards and forwards of the washer, *b*; *c c c* are three rollers, two of which are covered with flannel, and between the largest of which the clothes to be wrung are passed, and the water pressed out of them, the pressure being increased or diminished by changing the position of the weights, *d*, on the levers, *e*. The other parts of the machine require no further description in a work merely intended to recommend it to general adoption, as one of the very best washing-machines that have ever been invented; being, we believe, the only one that has a really efficient wringing-machine. In the case of all large farm establishments, we would recommend the wash-house and laundry to be detached from the house; and to contain, besides the washing-machine mentioned, a mangle and drying-closet, the use of all which should be allowed, for one or two days in every week, to the families of the different workmen employed on the farm. There is a number of different mangles; but we are informed by a manufacturer of several kinds, on whose judgment we can place the utmost reliance, that none have yet appeared preferable to the common mangle, with the improved reversing movement, known as Baker's Patent, fig. 1263, by which the mangle may be moved backwards and forwards while the handle is turned continually one way, instead of the operator being required every minute to reverse the motion of his arm. This is effected by a wheel, *a*, having teeth in the form of pegs on the side, into which works a pinion,

1263

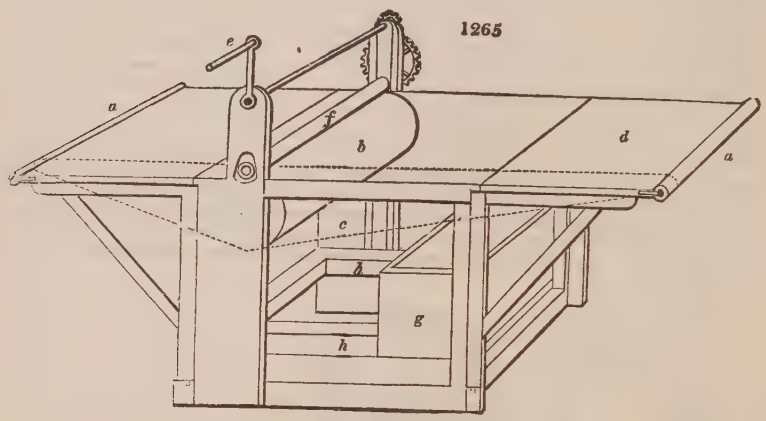


fixed on the end of a spindle, which rises and falls in a vertical groove, *c*, and works first on the under side, and then turns round in a channel at *d*, and works on the upper side. The opposite end of the spindle has a pinion, *e*, which is operated upon by a small wheel, which is turned by the handle, *f*. Where space is wanting, there are short mangles, which operate entirely by the pressure of leverage; such as Saul's Reform Mangle, and the Edinburgh Reform Mangle, and a number of others. We shall describe a very economical mangle, given in the *Mechanics' Magazine*, vol. xi. p. 104, and Saul's Reform Mangle. Fig. 1264 is an end view of a cheap family mangle, which is one foot four inches high, eight inches broad, and the rollers are two feet two inches long; *a* is a screw fixed to a piece of wood in which the upper roller works, for the purpose of raising it so as to put the linen between the two rollers; *b*, *c* are the pieces of wood in which the rollers work, fitted into grooves, in the upright standards, *d*, *e*;



f f are two strong iron screws to screw on the top, *g*, in which the larger screw, *e*, works: *h* is the handle fitted on the lowest rollers. The rollers are one foot eleven inches in length, and four inches in diameter. The uprights are one inch and a half square. When the linen is to be put on, the upper roller is raised up by turning the screw. Saul's Reform Mangle is stated by its inventor "to differ from any other mangle ever yet made public. Fig. 1265 is a perspective view of it as at work.

1265



Its total length, when the flaps at each end are raised up, as in the figure, is six feet, and when they are let down, it is two feet two inches square, and about two feet six inches high; so that the whole space which it occupies is little more than eight cubic feet. Although this mangle stands in and occupies so little space, yet it works in the same length as the common mangles, by means of an endless cloth fixed so that it passes round two small rollers, *a a*, at the extreme ends of the mangle, and under the bottom roller, *b*, as indicated by the endless dotted line *c*. The linen is placed on the endless cloth at *d*, and then, by turning the handle *e*, it is carried through over the roller *b*, and under the roller *f*, till it reaches the roller *a*. It is then turned back, or, by placing another mangling cloth upon the endless cloth, the linen to be mangled may be carried entirely round. Thus far it is to be considered as only effecting the purpose of a common mangle; but the iron roller, *f*, is hollow, and admits of a heater being placed in it; and, when this is done, the machine becomes an ironer as well as a mangle. To give pressure on the rollers, there is a box, *g*, on the two levers, *h h*, which box may be moved backwards and forwards at pleasure. This box may be loaded with stones, by which, and by altering its position on the levers, any degree of pressure may be given. The large roller is four inches and a half in diameter, and the small ones two inches and a quarter." We saw this mangle, when nearly completed, in July, 1831, and it appeared to us likely to answer the end proposed. A common mangle, with Baker's improved movement, costs, in London, from £8 to £12. The cheap mangle may be got up for 20*s*., and Saul's ironing mangle costs from £2 to £5.

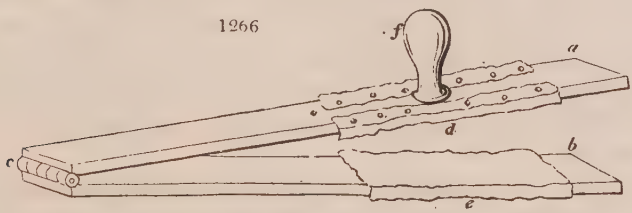
1382. *The Fittings-up and Furniture of the Brewhouse* are generally known. We have before hinted at the advantage of having the boiler so high that the wort can descend from it to the coolers: these being still sufficiently high to admit of the liquor descending in a similar manner to the vats or to the cellars. Domestic brewing utensils are so well known, that we shall not enumerate them: we shall notice, however, one improvement, which is that of keeping ale or beer to be drunk within the year in casks set on end, and formed rather wider at top than at bottom, gradually tapering downwards, and not bellied in the middle, as is generally the case; by which means, as the liquor descends, in consequence of being drawn off for use, the head or scum which has formed on its surface still covers it entirely, and preserves it effectually from the air. This is by no means the case with liquors kept in cylindrical casks placed on their sides; or with casks placed on end, which are not widest at top, and gradually tapering to the bottom. A highly improved method of keeping beer, by Mr. Mallet, is described in the *Mechanics' Magazine*, vol. v., and will be noticed under public-house furniture.

1383. *The Fittings-up and Furniture of the Cider-house* have been already (§ 1312) given in sufficient detail. Where home-made wine is manufactured either from goose-

berries or grapes, there is a very excellent machine, comprising a hopper, crushing rollers, a trough, and press, sold by Weir and Co., Oxford Street, London, for the purpose of bruising the fruit and expressing the juice. There is also a simple and economical, but very effective, gooseberry crusher and press, figured and described in the *Gardener's Magazine*, vol. viii. pp. 542. 544.

1384. *The Furniture of a Cleaning-house, or Knife and Shoe House*, may either contain a wheel for cleaning both knives and shoes, and all movable parts of grates, such as we shall hereafter recommend as particularly suitable for inns; or, the very simple knife-cleaner, fig. 1266, may be used. In this figure, *a b* are two boards twenty inches long,

1266



six inches broad, and one inch thick, joined together, but not quite close, by a hinge at *c*; *d e* are two pieces of buff or belt leather stretched over the interior surfaces, and nailed on the exterior ones, and *f* is a handle, to assist in holding the apparatus steady. "In using it, lay powdered Flanders brick, or any similar dust, on the lower leather, shut the boards together, lay the left arm on the upper board holding the handle, put the knife, well wiped from grease, between the leathers, and four or five rubs forwards and backwards, not sidewise, will produce a beautiful polish on both sides; the shoulders and back may be polished by rubbing on the part of the leather turned over." This knife-board has been found to give great satisfaction. (*Mech. Mag.*, vol. ii. p. 409.) No machine for beating and brushing clothes has yet been invented; but it would be easy to make such additions to the knife and shoe cleaning machine, above mentioned, as would not only beat and brush clothes, but beat carpets. Already a machine for scouring floors has been patented in America; and we sincerely desire that it may soon come into use in this country, as well as the other machines mentioned; for there are few labours more unsuitable for women than scouring floors, cleaning grates, and wringing clothes. The American scrubbing-brush is to be worked backwards and forwards by a lever, operating in the manner of a pump-handle. A flat board, on which the operator stands, is placed upon the floor on castors; and from this rise two uprights, to sustain the pin that is the fulcrum of the lever. To the lower end of this lever the scrubbing-brush is attached. It would be easy to modify this machine in such a manner as to render it fit for rubbing tables. (See *Mech. Mag.*, vol. xv. p. 109.)

1385. *For the Ashpit of the Kitchen-court* a cinder-sifter is a very useful utensil. For the small ashpits or dustholes belonging to houses about towns, there is a portable box, in which is placed a sieve; and, the ashes being put in, the lid put on, and the box shaken, the dust passes through the sieve, and remains in the bottom of the box; without any dust having escaped to annoy the operator. But this machine is on too small a scale for a farm-house, which would either require a portable one, of double or treble the usual size, or a screen operating in a large box. When the intention is thoroughly understood, such a machine may be easily contrived by the commonest country carpenter. The object is not merely to sift the cinders, which never can be done more effectually than by a common riddle or sieve; but to sift them in such a manner as not to incommode the sifter by the dust. For this purpose, all that is necessary is to make such an arrangement, as that the riddle may be worked in a large box, by a rod passing through the box, and attached to the riddle within; the latter resting on two laths or rails, and having sufficient room in the box to admit of its being worked backwards and forwards. A friend of ours, and a valuable contributor, Mr. Laxton, has his dusthole enclosed on all sides, with a door in front; and through a hole in this door, the rod passes, which works the riddle. The riddle is square, and rests on two laths, placed horizontally about 3 feet from the ground; and when the riddle is pushed as far back as it will go, the handle projects beyond the door when the latter is shut, just as much as to enable a person to take hold of it. In the morning, when the girl carries out the ashes, she opens the dusthole door, and empties the cinders into the sieve, without changing its position; she then shuts the door, and, taking hold of the handle, draws it to her and pushes it from her for ten or a dozen times, according to the quantity of ashes which she has put into the riddle. She then leaves it, without opening the door, in order that

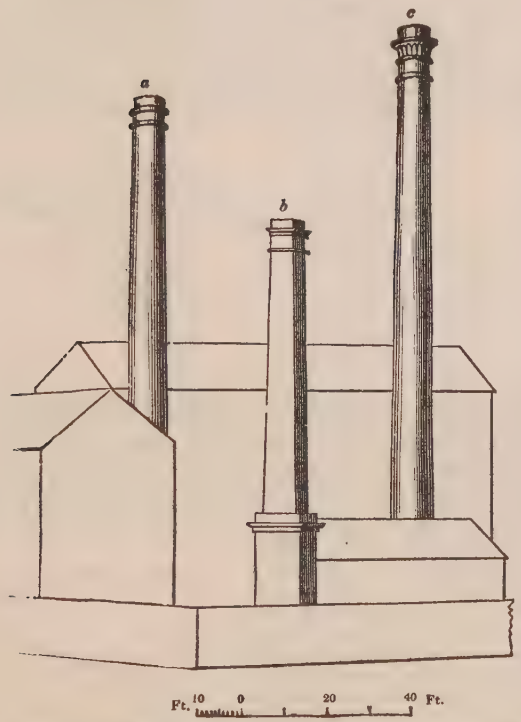
the dust may subside; and, returning after breakfast, gives one single movement to the handle of the riddle, merely to shake off the dust which may have settled on its rim. She then takes out the riddle, and empties it into a cinder-box or scuttle for use. Trifling as all this may appear to some, it is yet of great importance; because, how can a servant be expected to be cleanly in her person or her work, if the very first operation which she has to perform in the morning covers her with dust? We have shown above, § 1373, how the dirty and disagreeable operation of cleaning grates in a room may be avoided, and we have now, we trust, pointed out a mode of sifting ashes, whether on a large or small scale, so as to avoid the disagreeable consequences of covering the operator with dust. We may add, also, that the operation is more likely to be well performed by this contrivance, and fewer cinders lost among the ashes.

1386. *The Finishing of the Surface or Floor of Kitchen-courts* and their offices should always be sloped, so as to lead all the water which falls on them to a trap over a drain at one point. This will greatly facilitate the process of cleaning, whether with a scrubbing-brush or broom: and it also promotes the rapidity of the drying process, by natural evaporation, which must necessarily contribute materially to the purity of the air, and the healthiness of all houses where there are a number of apartments or offices on the ground floor.

Subsect. 2. *Of the Finishing, Fixtures, Fittings-up, and Furniture of Farmeries.*

1387. *The External Finishing of Farm Buildings* ought to be simple and durable. All the woodwork exposed to the open air ought to be well covered with paint, of which, the anti-corrosive kind before mentioned, § 546, is the best. When the roofs are covered with tiles, painting them with tar during the hottest weather in summer adds to their durability, as well as harmonises their colour with that of the surrounding objects. The walls, when not of a very durable material, may be roughcast, or whitewashed; but the last should never be resorted to under the pretence of adding to their beauty, by those whose standard for that quality rises higher than mere glare and smartness. As it is extremely probable that steam will soon be very generally employed for impelling threshing-machines; and as nothing disfigures the country more than red brick chimney-shafts, like those common in the manufacturing towns of Lancashire, we would strongly recommend some attention to elegance of form in these very conspicuous parts of a modern farmery. We have already referred to the chimney built by Mr. Capper, at Birmingham, as a model of excellence in this respect; and a correspondent having cited "Glasgow as a good example, both for the remarkable elegance of the shafts or obelisks, and the happy terminations by which ornament is given, and yet so as to be conducive to utility," we have applied to our architectural correspondent there, Mr. Reid, for sketches of some of them; and he has sent us a view of the three which happened to be nearest to his residence. In this sketch, fig. 1267, *a* is 130 feet high, five feet in diameter at the top, nine feet in diameter about ten feet from the ground, and circular throughout; *b* is eighty feet high, square throughout, and four feet on the side at the top; *c* is 150 feet high, five feet six inches in diameter at the top, and ten feet in diameter at the height of ten feet from the ground. Fig. 1268 is the chimney built by Mr. Capper at the Union rolling-mills, near Baskerville House, Birmingham: it is 162 feet high, the pedestal being thirty-one feet high; the diameter at the top is four feet six inches, of the plinth at the bottom of the circular shaft fourteen feet, and of the octagon dado of the pedestal fourteen feet; it contains 200,000 bricks; and cost, in building, £420. Of the Glasgow steam-engine chimney shafts, Mr. Reid observes that till lately they were made square in the plan, and built from scaffolding placed on the outside; but that now they are generally built circular, from the inside. All the scaffolding employed is a continued central post, in the centre of the flue, from which cross pieces, at intervals of a foot or eighteen inches, are fixed with their ends in the brickwork, to serve as a stair by which the workmen, in building, may ascend and descend; the materials being hauled up outside with tackle. Formerly winding staircases were built outside these chimney-shafts; but Mr. Reid says they have a bad effect, and, therefore, he has paid no attention to them in his sketch. Could a few such shafts as those of Mr. Capper be introduced into the farmeries of Scotland and Northumberland, the effect in the landscape would be excellent. It is only necessary to imagine them, as the traveller moves along the public road, rising into view one after another, on the prominences of the plains, and on the cultivated sides of the hills, backed by the mountains, which appear in the distance in every part of that beautiful and picturesque portion of Britain. Perhaps the time may come, when, from almost every large farmer being the proprietor of the land he occupies, there will be a competition among them as to who shall erect the handsomest shafts, similar to what there was in former ages among the Catholic clergy as to the building of spires to their churches and monasteries. Like the spires and towers of churches, the column and the obelisk are forms that, though without variety in them-

1367



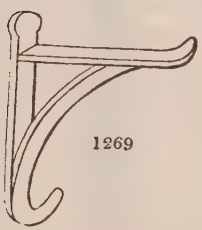
1268

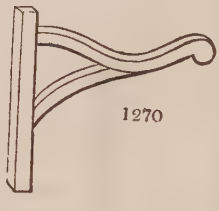
selves, yet, when high, and elegantly proportioned, never tire in the general view, however often they may be repeated. We strongly recommend this subject to the attention of Architects. The public have surely a right to expect that such conspicuous objects as engine chimney-shafts are, in the country, should be built in what is considered good taste, no less than spires of churches. Every farmery has one or more common chimney-shafts; and on the form of these, as well as on that of the chimneys of the farm house, of the cottages, and of the boothy, much of the architectural and picturesque beauty of every farmery will depend. It should never be forgotten, that the chimney-tops are the first parts of dwelling-houses which strike the eye at a distance in most cases; and that our first impression, as to the architectural style of the edifice to which they belong, is generally taken from them.

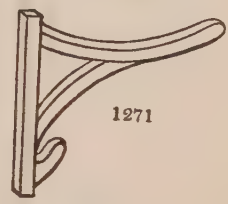
1388. *The Internal Finishing of Farm Buildings*, we have seen by the different specifications, is very simple. The stable, the barn, and the granary, are almost the only buildings which are generally plastered within, and none but the better description of riding-horse stables have a plaster ceiling. In general, the internal surface of the walls ought to be built as fair and smooth as possible; by which means, more especially if the materials of the walls be brick or freestone, no plastering of the walls can be wanted in any part of the farmery. In almost every part of the farmery, it is desirable to have the ceiling open, and the timbers of the roof freely exposed to the air. To promote this end, openings ought to be left all along the side walls, immediately under the eaves, except in situations where these openings would admit too much of the exterior air in winter for the health of the animals lodged within. It may be laid down as a general principle, that the durability of the timbers in the roofs of farm buildings depends entirely on their thorough ventilation. After these general remarks, we shall proceed to the fittings-up and furniture of the component parts of the farmery, and take them in the same order in which we treated of their plans in the preceding section.

1389. *The Stable*, if the surface of the interior walls be not very smoothly built, ought to be plastered on that side on which the harness is hung, or else lined with boards. There ought either to be small cupboards, or recesses formed in the wall, for the currycombs,

brushes, pickers, &c., or wooden bins for keeping them in; and there should be a harness-room, for harness not in common use, with a fireplace or stove for heating it in damp weather, as well as proper openings for ventilation. The harness is generally hung on hooks or pegs, which are sometimes formed of wood, and nailed to the rafters, but most generally of hooks driven into the wall. Fig. 1269 is a double harness-peg, or bracket, of cast iron, for nailing against the wall, from which it projects ten inches, and which costs 1*s.* 6*d.* Fig. 1270 is a saddle-bracket of iron, which projects twelve inches, and which costs 2*s.*; and fig. 1271 is a saddle-bracket and bridle-hook, which projects twelve

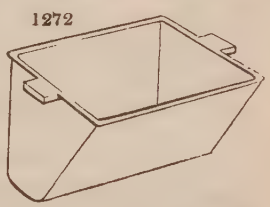

1269


1270


1271

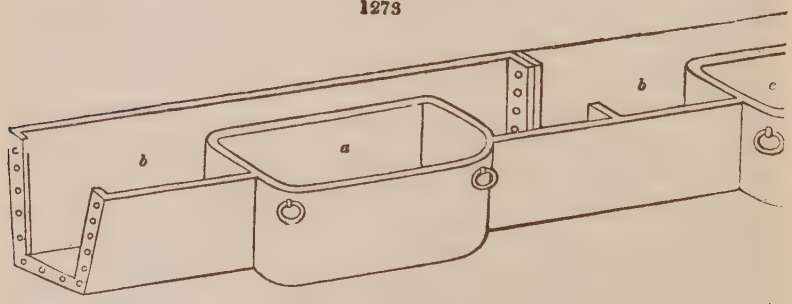
inches, and costs 2*s.* 6*d.* In some places, small cast-iron hollow cylinders, the tubular part being about an inch in diameter, are built into the walls of stables and harness-rooms, so as not to project beyond the inside face of the wall; and, in these, wooden pegs are inserted and taken out at pleasure. This we believe to be much the cheapest and best mode for common farm stables. There is a cast-iron halter-ball, which costs, by retail, 6*d.* or 8*d.*: in some districts they might be made of stone; and where terro-metallic potter's earth abounds, they would answer well, as would mangers and other fixed cattle-troughs, of that hard and durable material. Where expense is not an object, all balls of this sort ought to move up and down in a trunk, so as not to incur the risk of becoming entangled with the horses' feet. Among the stable utensils, such as pails, &c., we shall only notice Cottam's cast-iron gruel-trough, fig. 1272, fifteen inches long, ten inches wide, and nine inches deep, for giving bran mashes, which may be conveniently set in the manger. Two and three pronged forks, brooms, and shovels, complete the stable implements.

1272



1390. *The Cow-house*, as we have already shown, admits of a variety of finishing and fittings-up, with respect to the troughs and mangers, and the mode of tying. Fig. 1273

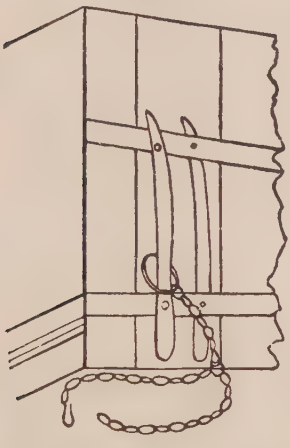
1273



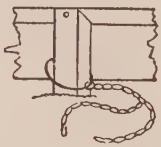
shows a mode of riveting cast-iron plates together, so as to form troughs for dry food, *a*, and others for water or moist food, *b*. Figs. 1274, 1275, and 1276 are modes of fastening milch cows, in use about London. By the first mode the cow is fastened to the stall partition; by the second, to the post which supports the manger; and by the third, to the bottom rail of the manger. Fig. 1277 is the Normandy brechin, which is commonly put on cows in France, to prevent them from tossing up their heads, and thus risking abortion, and which also prevents them from cropping the branches of fruit trees

in orchards; for the latter purpose it well deserves adoption in this country. Fig. 1278 shows the manner in which it is used.

1274



1275



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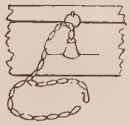
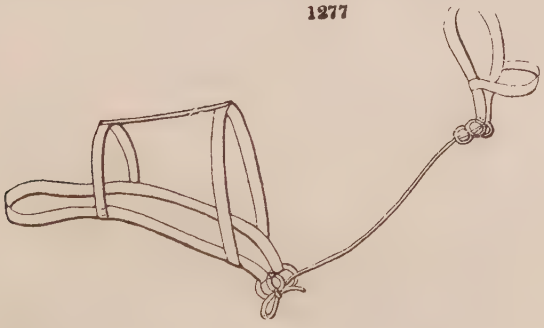


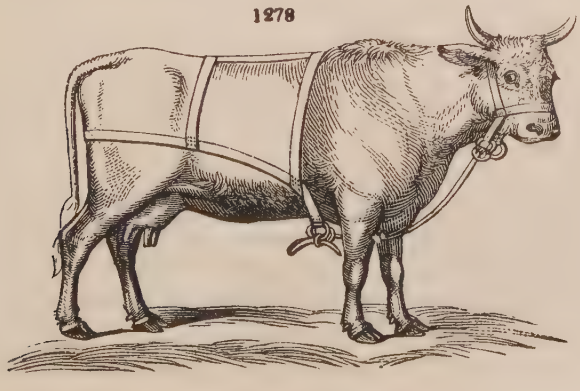
1391. *Cattle-sheds and Calf-houses* require scarcely any fitting-up beyond what has been already mentioned. There are various descriptions of cribs, of wood, stone, and iron, for foddering-yards. It is objected by some, to fixed stone troughs, that they are not so easily cleaned as portable wooden ones. In some places oblong cribs are fixed to the tops of posts, so as to turn on pivots in their centres; in others they are placed on the top of a wall. Hay-racks are also often placed on the tops of the division walls of farmeries, as indicated in the section, fig. 1279; which, while it provides a double rack for two yards, saves the expense of heightening the division walls. The iron tethering-stake, fig. 1280, which is twenty inches long, and

1277



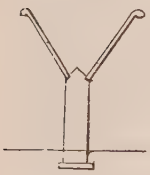
costs 5*s*., is useful both for tethering calves and other young animals, when first taken out to the open air.

1278



1392. *Various Fittings-up for Piggeries* have been shown in the miscellaneous designs for farmeries; and in the way of furniture, there are numerous iron troughs, both for sties and open yards. Fig. 1281, which is twenty-six inches in diameter, and costs 26*s.*, is well adapted for open straw-yards. Fig. 1282 is a section of this trough on a larger scale. There are sheet-iron pails, exceedingly useful for carrying out pigs' food, and for various farmery purposes, which cost from 4*s.* to 7*s.* each; and which, when heated nearly red hot, and immediately afterwards rubbed over with oil or grease of any kind, will last many years, without requiring paint.

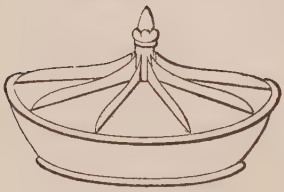
1279



1280

1393. *For Sheep-houses* there are various descriptions of racks and mangers, but little that is peculiar. For the open air there is a covered iron rack, fig. 1283, with a trough below, formed wholly of iron, six feet long, which costs, by retail, in London, £4.

1281



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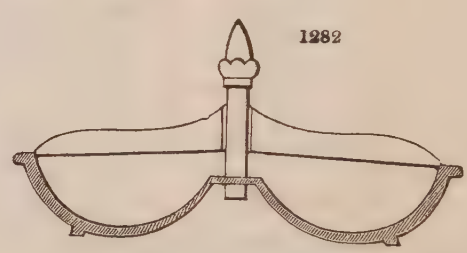
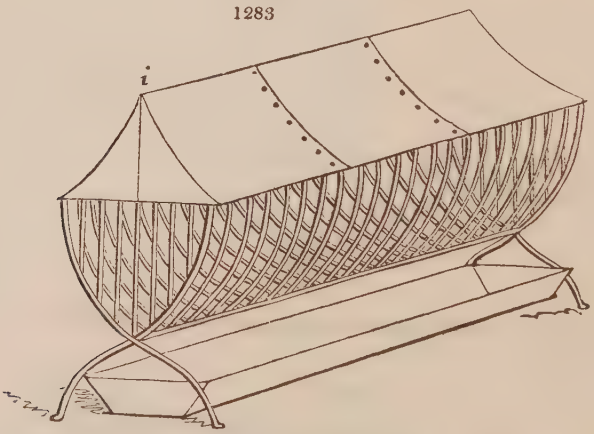
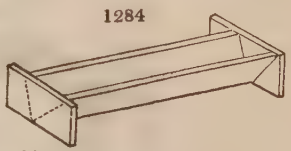


1283



1394. *Of the Fittings-up of Rabbit-houses, Poultry-houses, and Pigeon-houses* scarcely any thing requires to be added to what will be found in § 769 to § 771. The side walls of pigeon-houses are fitted up with holes nine inches square, with a shelf from four to six inches wide in front; the material used being either wood, slate, brick, or stone, according to convenience. When a pigeon-house is formed chiefly in the roof of any building, the holes or boxes may depend from the roof, like a reversed stair, as we have seen in fig. 1019, § 1020. There are iron hutches for rabbits, and even small iron rabbit troughs, such as fig. 1284, which is fourteen inches long, four inches wide, three inches deep, and costs 2*s.* 6*d.*

1284



1395. *The Fittings-up of the Barn*, when there is a threshing-machine, embrace a variety of considerations. When the machine simply beats out the corn, and separates it

from the straw, one floor on the ground is sufficient; but when, in addition to separating the corn from the straw, the corn is to be winnowed and sifted by the machine, a loft or second floor, from eight to ten or twelve feet, over the first, is essentially necessary. This floor is used for containing the unthreshed corn, which is commonly carried into it from the rick-yard, on hand-barrows, up an inclined plane or gangway; but which is sometimes also carted into it, up a broad inclined plane, the cart being unloaded and turned round in the loft. This mode of carting the corn into the loft is only to be met with on very large farmeries, or where the buildings are particularly situated; such as being on a declivity: a more common practice is, to set back a cart loaded with sheaves within the barn on the ground floor, and unload it, forking up the sheaves to the threshing-floor, as in Mr. Donaldson's very excellent Design, § 891. From this floor there is a communication by a stair, or step-ladder, with the floor below on which the corn is cleaned, and from this cleaning-room there is a communication with the chaff-room adjoining, in which the chaff and refuse are contained. A clear idea of the arrangement of threshing-machinery, impelled by horses or water, relatively to the walls and floors of the barn, may be obtained by referring to our *Encyc. of Agr.*, 2d edit. § 2786 to 2790, and the following Design will give an idea of the arrangement where steam is employed.

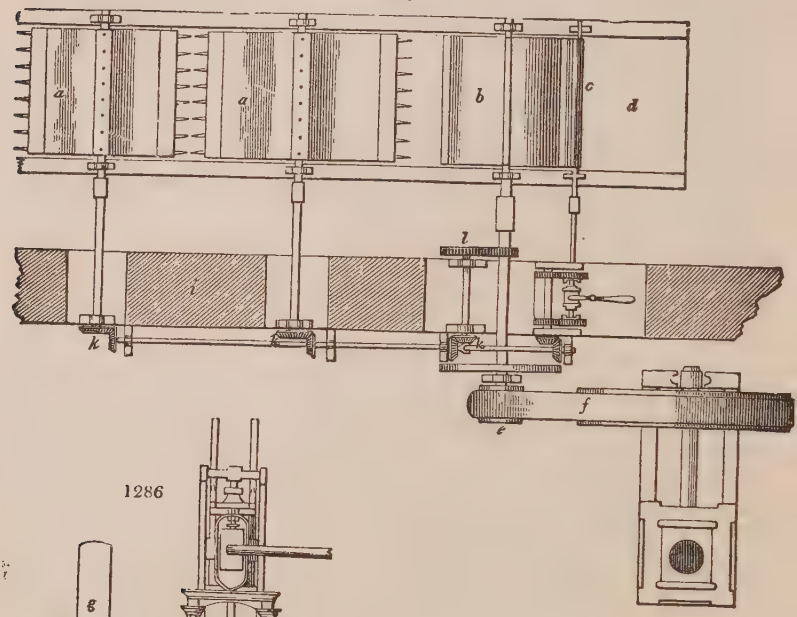
1396. *The Fitting-up of a Steam Threshing-machine.* The application of steam to agricultural purposes has hitherto been very partial, and almost entirely limited to impelling the threshing-machine. Till lately, low-pressure engines only were used for this purpose; but Mr. Burstall, an ingenious engineer at Leith, has now introduced, very extensively, the high-pressure or non-condensing engines. "These seem to be superior to the low-pressure engines in various respects: first, such engines are considerably cheaper in the original cost; secondly, they do not require more than one twelfth or one twentieth part of the water which is requisite for a condensing engine; and, thirdly, a knowledge of their management is more easily acquired. They are thus rendered more fit for farm labour; and, when properly made, are certainly as safe as, if not more so than, condensing engines"

1397. *The Application of* Mr. Burstall's method of employing a high-pressure engine for moving a threshing-machine is extremely simple. It is well known that there are two modes by which, in mechanics, a slow motion with great power may communicate a rapid motion. The first is, by means of wheels and pinions; the second, by means of smooth or iron cylinders, to which a broad strap adheres by its friction, and conveys the power from the prime mover to the acting agent. In the one case, there is a constant and definite number of teeth acting on each other; in the other case, there is what may be considered as an infinite number of teeth: that is, the surfaces of the belt and cylinder, applied to each other, produce the same result. The use of the belt to drive machinery is of much later date than that of toothed wheels; but it may be safely affirmed, that, where high velocities are required, the former method has considerable advantages, and is gaining ground in the practice of machinery. Mr. Burstall is, we believe, the first who has made a successful attempt to drive the main cylinder or drum of a threshing-machine by the direct application of this principle; and among other great advantages of the belt over gearing is this, that, should foreign substances get into the mill, the belt is at once thrown off, and this is all the injury that results; whereas, when with wheels and pinions a like accident occurs, an expensive wheel or shaft is generally broken. For these reasons, Mr. Burstall communicates directly the motion to the machinery of a threshing-mill by means of a belt. The method will be seen from the accompanying figs. 1285 and 1287. The application of the steam power, in this case, is made to an old threshing-mill, formerly driven by horse power and gearing, and altered to steam and belts. The machinery for driving the rakes and rollers has been retained, although it is clear that, as the main machine is well driven by a strap, the subordinate parts, which do not take one sixth of the power, can be so driven likewise.

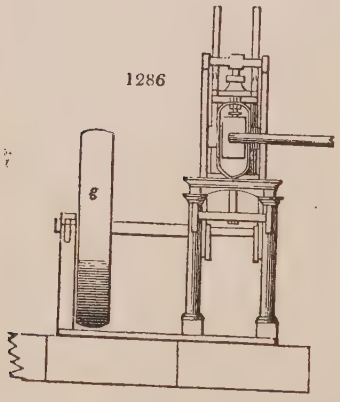
1398. *Details.* Fig. 1285 is a ground-plan of a threshing-mill, with the barn walls and steam-engines. Fig. 1286 is the end elevation of the steam-engine as placed outside of the barn walls in the engine-house. Fig. 1287 is a front elevation of the steam-engine. The letters of reference are the same in the three figures; *a a* are the rakes; *b*, the drum and scutchers; *c*, the feeding or supplying roller; *d*, the feeding-table; *e*, a rigger, or smooth cylinder, fixed upon the end of a shaft that couples to the drum-shaft of the threshing-mill; *f* is the belt, from eight to ten inches wide, according to the power of the mill; *g*, the fly-wheels of the steam-engine, lined up with wood, to form a drum for the belt to run upon; *h*, the shafts and gearing to drive the rakes and rollers; *i*, the barn wall; *k*, the wheel and pinion from the main shaft. It is understood that the machines erected by Mr. Burstall on this simple principle have given great satisfaction. (*Highland Soc. Trans.*, vol. xi. p. 235.)

1399. *Of Threshing-machines driven by Water,* the most complete which we know of

1285



1286



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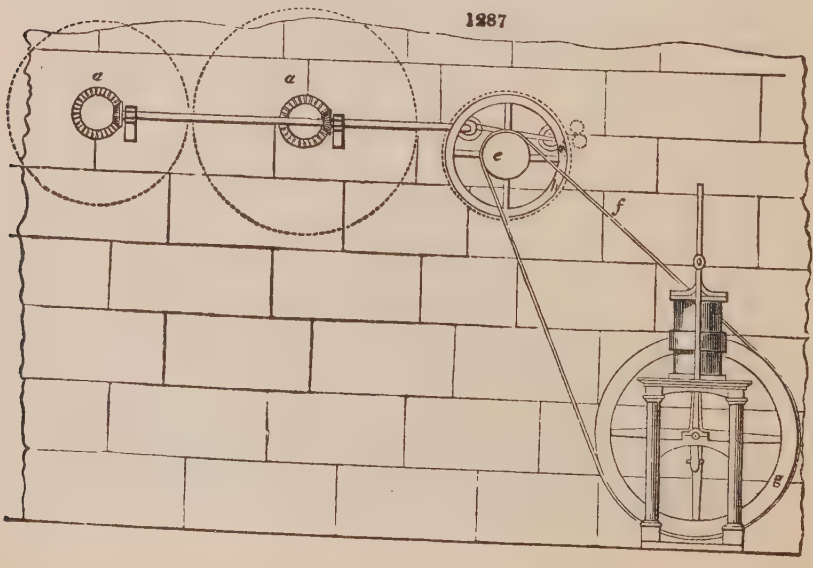


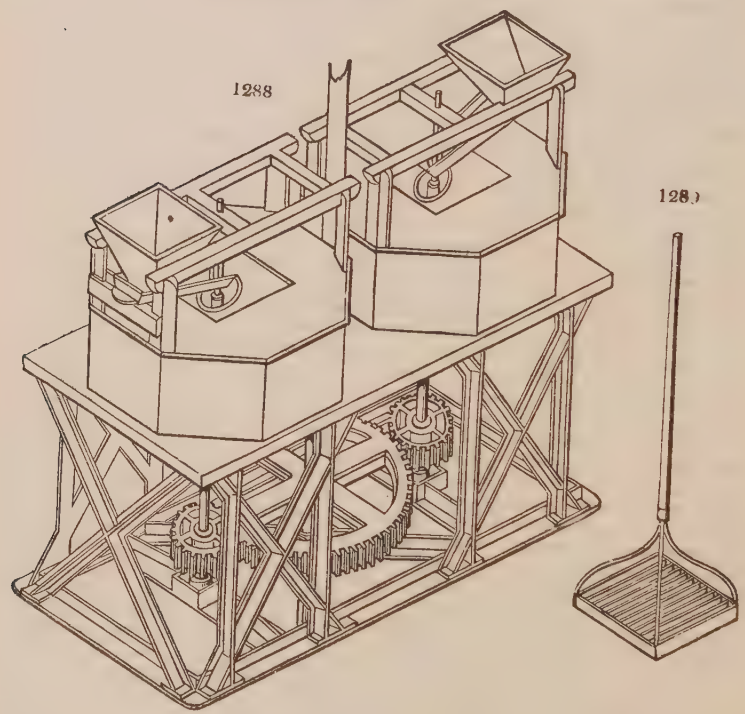
are those at the farmery of Bagshot Park, Berkshire; and at Wynnstay, Flintshire. The former has been figured and described in the Appendix to the second edition of our *Ency. of Agr.* It cleans the corn most completely, having a chain of buckets for bringing up, to pass a second time through the mill, the short stalks and imperfectly threshed ears, which are delivered into these buckets by the winnowing-machine. There is also a travelling sheet or corn elevator, fixed at an angle of about thirty degrees, with laths of wood across it at regular distances, which acts as buckets in carrying up the corn from the lower winnowing-machine to the upper one, to be passed through a second time. There is a power of throwing, not only any part of the machinery out of gear, but even of reversing the motion of any part. There is a pair of French burr-stones for grinding meal, a turnip-slicer, a straw-cutter, and a bone-crusher; besides which, there are arrangements and room for adding any other machine that might be required. This machine was executed under the direction of Mr. Burns, the Duke of Gloucester's most ingenious bailiff, by a local millwright. The machine at Wynnstay was erected by the late Mr. John Gladstone of Castle Douglas (the ingenious inventor of several agricultural implements and machines), about the year 1812; and complete plans and descriptions of it were furnished to us, in 1830, by his nephew, Mr. John Gladstone, engineer to the Chester leadworks; a young man of great modesty and ingenuity. The site of the Wynnstay mill is on a declivity, and the barn has three floors. The upper one opens into the stack-yard, being on a level with its surface; the second floor contains the first winnowing machine, with a chaff-house, which descends to the floor below, and has one door into the straw-house and another into the cattle-yard. When the corn is only wanted to pass through the first winnowing-machine, the corn elevators and the second winnowing-machine are thrown out of gear, and the corn is delivered on the second floor. Here a bruising-machine is fixed. The under floor contains the second winnowing-machine, with the lower end of the corn elevators. The corn may be delivered on this floor, instead of into the trough of the elevator, by throwing the latter out of gear. The elevator trough conveys the corn to a room on the upper floor, which serves as a granary, and there throws it into a weighing-machine, which is connected with an index in the barn, placed on the partition wall facing the man at the feeding-table, and consequently showing him the quantity of corn threshed. The chaff and short straws from the first winnowing-machine are elevated to the feeding-board by a chain of buckets, as in the threshing-mill at Bagshot (which appears to be, to a certain extent, an imitation of the Wynnstay machine), and passed through the machinery a second time. This chain of buckets is a very useful appendage to a threshing-machine, as it takes from the winnowing-machine all the refuse which generally accumulates on the cleaning-floor, and, by passing it through the machinery a second time, separates it into corn and chaff. The water-wheel is in a house beside the barn. In a room above the wheel is a Scotch barley-mill, and, beyond that, a very complete saw-mill; both driven by the same wheel, and both easily turned out of gear when the threshing machine is at work. In the middle floor is an oat-bruiser and a straw-cutter; and there is every convenience for adding such other machines as may at any time be considered desirable. We have noticed what is effected by these two machines, to show that, when once steam shall be generally applied in farmeries, the labour both of men and horses will be diminished in an almost incredible degree. By applying the steam-engine to the plough and other instruments of aration, and to reaping and mowing implements, very few horses would be wanted, even on the largest farms. The good that will result from such a change will be immense; even the superior degree of intelligence requisite to put up, to work, and to repair steam-engines, will in a short time have an influence on the condition of the farm labourer, and approximate him more nearly in intellect to the mechanic. The result will also benefit the quadrupeds and fowls kept on a farm; for, as soon as farmers become familiarised with steam, we are persuaded they will have all the straw, not to be used as thatch, cut into chaff, and all farm-yard food whatever cooked, either by steam or hot water, before being given to the animals. This will not take place without carrying with it the heating of the cottagers' floors by steam.

1400. *A Saw-mill* is a most valuable machine, wherever there is much timber to be cut, and, in all new countries, may be considered not less essential than the limekiln or brick-kiln. Any building ten or twelve feet wide, twenty or thirty feet long, and open at one end, so as to admit long trees, may be adapted for a saw-mill, by excavating a trough in the floor for the action of the saw.

1401. *Portable Threshing-machines,* to be worked by horses, commonly thresh only, without cleaning the corn; and therefore they require no particular modification of the barn. There is an excellent cast-iron machine of this description, invented by Mr. Baird of the Shotts ironworks; and there are some in England which are impelled by steam, and employed to thresh out a crop in the fields, on a movable floor, under a temporary roof, a few weeks after the crop has been cut; the straw being in that case

consumed, or turned to manure, in a temporary cattle-yard on the spot. Hand threshing machines have been constructed of various kinds; but they have never yet given much satisfaction. On small farms, however, a machine of this kind, requiring less skill to use it than the common flail, must be a considerable advantage, since a thresher is paid higher wages than a common labourer. A design for a hand threshing-machine is given in the *Transactions of the Highland Society of Scotland*, vol. viii. p. 262; where it is observed, that, the labour required to move these machines being very considerable, it has been found that the labourers employed on them must be relieved at intervals. This is thought to be the reason why these machines have not been so generally adopted, in the smallest class of farms, as might at first view be supposed. To diminish this labour, it is recommended to confine the operation of the machine to the beating out the grain by the action of a revolving drum or roller, and not to attempt separating the grain from the straw, or winnowing it.

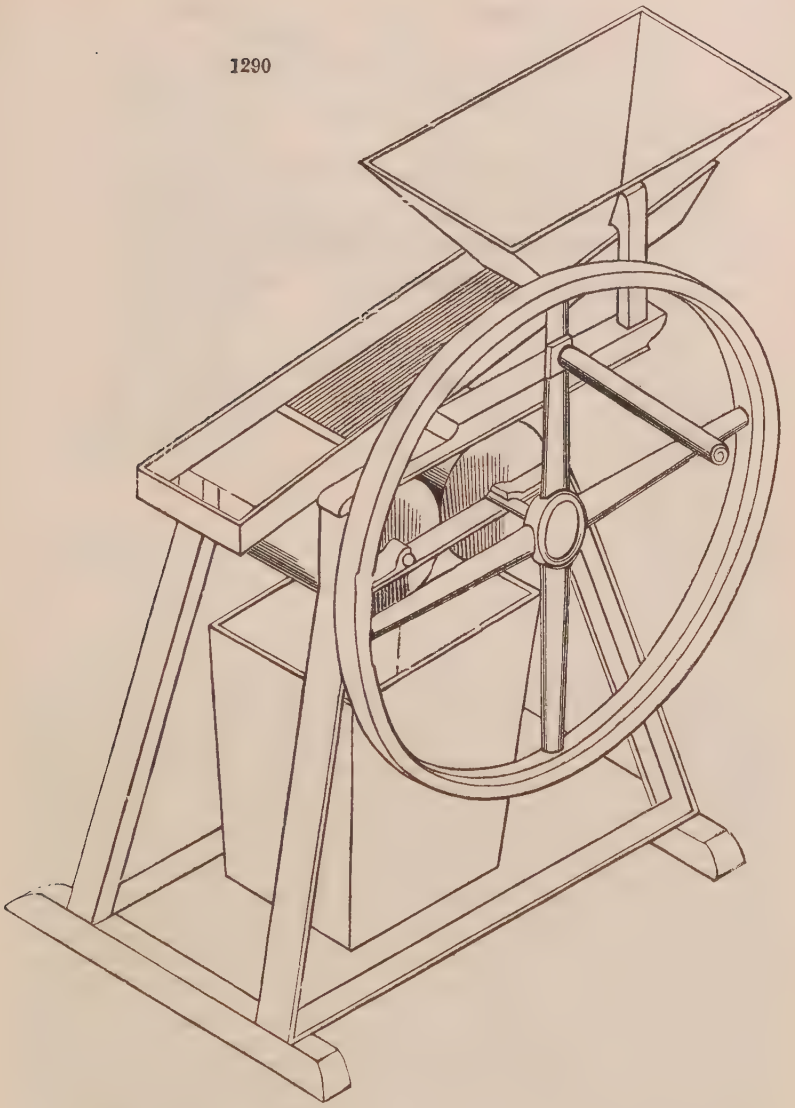
1402. *The other Machines, Implements, and Utensils of a Barn* are, the winnowing-machine, now brought to great perfection; the barley-chopper, or hummelling-machine, or which is sometimes substituted the implement, fig. 1289, which costs 8*s.*; the smut-



machine, shovels, forks, rakes, sieves, a sack-weigher, a sack-carrier, and a bushel and other measures, according to the locality or country. A very ingenious tub for measuring and weighing corn has been invented by our esteemed contributor, Mr. Taylor; it has been in use for some time at the Whittington malt-houses, near Stoke Ferry, Norfolk, and will be found figured and described in the *Gardener's Magazine*, vol. viii. p. 466. All the other machines and implements required by the British agriculturist will be found in our *Encyc. of Agr.*, 2d edit.

1403. *Among the Farmery Fixtures and Furniture*, which may be placed in the chaff-house, the steaming-house, store-house, foddering-bay, or cattle-food house, may be enumerated the oat-crusher, bone-crusher, the turnip-cutter, the straw-cutter, and the portable corn mill. All or any of these, and several others, might be placed in a building adjoining the threshing-machine, and, as already mentioned, § 1223, might be driven by the same machinery. Our correspondent, Mr. Thorold, has sent us a drawing of an oat-crusher, fig. 1290, which he manufactures, and sells at £8 : 8*s.*; he has also

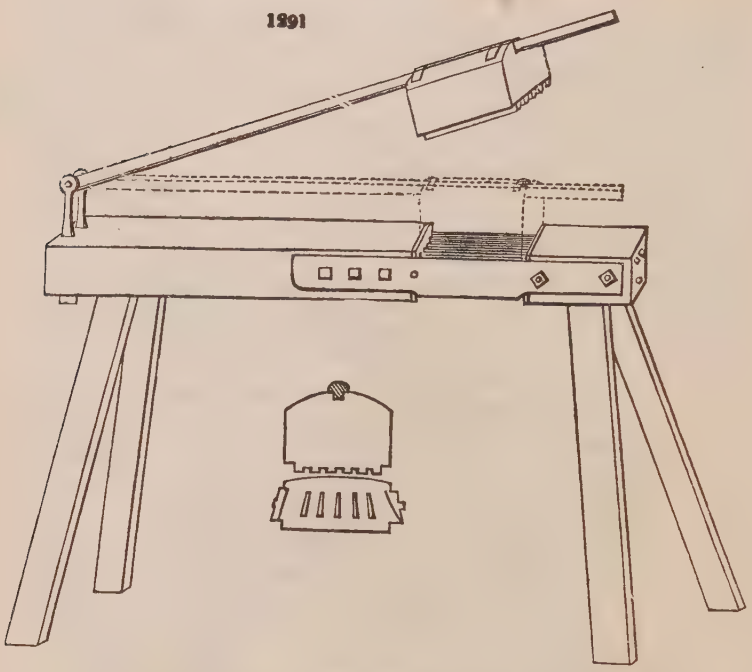
1290



sent us a turnip-cutter of his invention, fig. 1291, for which he received a premium from the London Society of Arts. The most complete turnip or potato-cutter, or slicer, that has been hitherto made known, is that recently invented by Mr. Baird. It costs £4, and, with an extra-wheel to cut potatoes, £1 additional. This machine, with a man and boy, will cut a cart-load of turnips or potatoes, in twenty minutes, into very small pieces. We have no doubt that this machine might be advantageously applied to the cutting of cabbage, in countries where sauer kraut is used.

1404. *A portable Corn-mill* of a very superior description, manufactured by Mr. Thorold, and sold by him for £250, is shown in fig. 1288. In this figure, " cast-iron hurst frames are represented, capable of being erected independently of any building, only requiring a solid foundation, and containing wheelwork, and two pairs of French stones, four feet in diameter. The iron spur-wheel and two pinions are shown, for giving the

1291



requisite speed to the millstones; the spur-wheel has wooden cogs, and the pinions iron cogs neatly pitched and trimmed. The pinions are hung upon cones attached to the stone spindles, and may be thrown out of gear by a ring attached to a lever and rack-work, not shown in the figure. When it is intended to drive the mill by wind, the upright shaft of the spur-wheel is continued upwards until it reaches the cap-works of the windmill; when it is to be driven by steam, a mitre-wheel is fixed on the upright shaft just above the spur-wheel, which is intersected by another mitre-wheel hung on the fly-wheel shaft of the steam-engine. When driven by water, a similar arrangement is made, with different speed, to assimilate with the speed of the first mover. The slip brasses of the stone spindles pass through bored boxes, so as to be free from shaking; they then rest upon a steelyard connected with a screw which serves to adjust the millstones at the pleasure of the miller. These, with the spouts and meal-troughs, are omitted in the figure, for the sake of showing the wheel-work, the whole of which forms a complete and substantial piece of machinery. In this machine, mitre-wheels may be attached to the upright shaft, so as to adapt it for a steam-engine; which might also drive the threshing-machine of the farm."

1405. *The Fittings-up of the Boiling and Steaming House* are exceedingly simple to those who know any thing of steam. We shall give as an example, an apparatus invented by Mr. David Liddell, junior, and described in the *Highland Society's Transactions*. It consists of a furnace, and cast-iron boiler containing about sixty gallons, fig. 1292, *a*, "furnished with a safety-valve, to render it secure from danger, even in the hands of the most ignorant person. This boiler is intended to supply warm water for any domestic purpose, as well as steam, the water being drawn off by a cock in the lower part of it. The boiler is supplied with water from a cistern, *b*, placed five or six feet higher than the boiler. This cistern may contain about thirty gallons, and, when filled, requires no further attention, as the boiler regulates its supply of water, by means of a float in the inside of the boiler, attached to a valve in the cistern, which contains as much water as will boil ten hundredweight of potatoes. The two casks, *c* and *d*, are for holding the produce to be steamed. They contain about three hundredweight each. The steam is conducted from the boiler to them by a pipe (one-inch) branching off to each by stopcocks. As many casks as may be necessary for the supply of food may be attached in the same way. The casks are furnished with sliding hatches in the bottom, for taking out the food when ready, and are raised as far from the ground as will allow a trough,

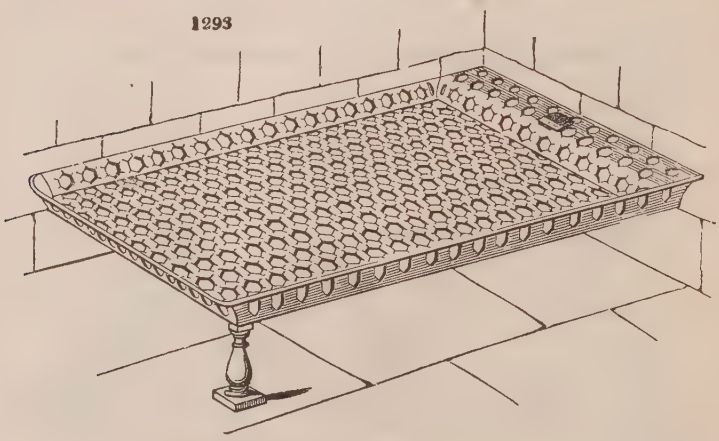
1292

or barrow to be introduced under them, to receive the contents. For boiling grain, the cask for holding it differs from those used in steaming potatoes only by not having a hatch in the bottom, as the hatch could not be easily made tight, which is necessary in boiling barley, as water must be mixed with it in the same quantity, or nearly, as if it were to be boiled in a boiler the common way. It may be added, that the hatch not being tight, in boiling potatoes, is an advantage, and even necessary for allowing the condensed steam to run out, and also all the earthy matter from the skins of the potatoes. In the figure, one of the casks is represented with the lid pressed down, by means of the vertical bar, which is employed for this purpose during the operation of steaming or boiling. In the other cask, the lid is represented as opened, with the vertical bar moved to one side. (*Highland Soc. Trans.*, vol. viii. p. 322.)

1406. *The Fixtures and Furniture of Farm Labourers' Cottages* differ in nothing from those already given for cottages generally. The grates ought always to be landlord's fixtures, and so ought the presses, cupboards, and dressers. It would add greatly to the comfort of the occupant if the bedsteads were also the property of the landlord; because he would be saved the trouble of carrying them with him on removal. This is sometimes the case in gardeners' houses, where even the chairs, tables, and carpets are landlord's property, and taken by one occupant after another at a valuation. All the fixtures and furniture of the boothy, or single men's room, ought to belong to the landlord; and the valuable hint of Mr. Gorrie, that the bed-room ought never to be on the same floor with the sitting-room, in order to avoid the temptation of lying down on the beds at unseasonable times, ought not to be forgotten. Wrought-iron bedsteads are well suited for the married cottager; and, where great strength and durability are the objects, there is a cast-iron bedstead, which may either be a fixture, as in fig. 1293, or made with four feet and portable, which is well adapted for the ploughman's room. These beds are the invention of Mr. Mallet of Dublin, and have been extensively used in Ireland. Most of the vessels for the boothy may be of cast iron tinned, such as are manufactured by Cottam in London, and Baird near Glasgow. The latter has lately invented excellent cast-iron tea or coffee pots, at 2*s.* 6*d.* each; and he sells tinned tumblers at 10*d.* each, tea-kettles at 2*s.* 6*d.* each, together with a number of other articles particularly suitable for the boothy, because they are little liable to be injured or broken. These articles, which might be purchased by the landlord, would last for many years, and contribute materially to the comfort of the inhabitants of the boothy. We have already shown how, in the case of all farmeries where there is a steaming apparatus for cooking food for cattle, the floors, both of the boothy and the adjoining married men's cottages, might be heated by steam, which to them would be a great source both of economy and comfort.

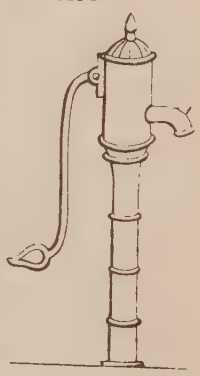
1407. *As Fixtures belonging to the Farmery* in general, rather than to any one part in particular, we include a pump; of which the most suitable kind for farmeries is that of cast iron, fig. 1294; which, according to the bore, or diameter, may be had at various prices from £2 upwards; the total price depending on the length of tube required to reach the bottom of the well. With the pump is necessarily connected a cistern, or

1293



supply trough, which should communicate with other troughs in different yards, according to circumstances, as already explained, § 824 and § 1143.

1294



All farmeries whatever, ought, in our opinion, to have a turret clock, § 505, placed in some conspicuous situation fronting the kitchen-court and the farm house, to regulate the hours of going to and returning from labour. Very good turret clocks may be had for £10 each, without the addition of a bell, and surely £10 in this way will pay the farmer better than the same sum laid out on a pocket watch. In large farmeries, to the turret clock ought to be added a bell to strike the hour; and this bell may be so hung as to serve for a bell to ring at the different times for going to and returning from labour. We have shown such a clock and bell in our own Design, § 1221, but we have not added them to the plans and elevations which have been sent to us by others, because these have, for the most part, been executed in different parts of the country without them. As much will depend on the accuracy of clocks of this kind, we consider it wise policy to procure them from some clockmaker in the neighbourhood, who may contract for winding them up, and examining them once a week, at so much a year, in order that they may be always kept in correct time. Whether there be a clock or not, there ought always to be a vane fixed on some lofty and airy part of the farm buildings, in order to show the direction of the wind; and no farmer who can afford it ought to be without a barometer, measuring-rods, and a measuring-chain. There is also such a thing as an index to ploughs, made by our most ingenious correspondent, Mr. Wilkie of Uddingstone, near Glasgow, one of the greatest improvers of the plough and the brake, or cultivator, of the day. The plough index shows how much ground the plough has gone over in a day, and consequently how much it has ploughed; but this, and similar instruments we can only recommend to amateurs, preferring in all cases the labour dictated by a sense of justice, duty, and good-will, to that obtained by constant watching and espionnage. When the relative duties of masters and servants are clearly understood by both parties, no eye-watching, measuring, or instruments of this kind, can ever be wanting; and farm labour, like most other kinds of labour, will come in time to be let by the job. For the hinges of farm-yard gates, those of Collinge are so decidedly preferable to all others, that all who can afford them ought to have them. (See *Mech. Mag.*, vol. xiv. p. 392.) As a fixed rat-trap for farm-yards, we know of none superior to that invented by Paul of Starston, and alluded to by Mr. Taylor, § 1040. A great number of other fixtures, fittings-up, and furniture, belonging to or connected with farmeries, might be mentioned, but they will all be found described or figured in our *Ency. of Agr.* We trust we have made such a selection, in this work, as to attain the end we proposed in the commencement of this section; viz., that of showing the necessity of Architects studying the uses of all the buildings which they are employed to design.

Chap. III.

Designs for Country Inns and Public Houses of various Degrees of Accommodation, from the Hedge Alehouse to the Mansion Inn, with its Gardens, Farm, and Park.

1408. *An Inn* differs from a private dwelling-house chiefly in having certain apartments and stores open to the public generally. In a private house all is private; but in an inn, one of the recommendations to the traveller is to see a well-stored larder, and a spacious public room, in which he may take his meals, either at a common table or at a separate table. Another characteristic of an inn is the bar, or office, to which all enquiries are addressed, and from which all orders are issued. This is always placed in a conspicuous part of the interior, so as to be seen on entering, and so as the bar mistress may observe all comers and goers as they pass, and have her eye as much as possible upon the servants of the establishment.

1409. *All Inns ought to be built fire-proof.* When the number of persons lodged in such dwellings are considered, the necessity for this will appear obvious. There are two ways in which this may be effected; first, by forming all the floors of flat arches of brick or tiles, and cement; or of hollow bricks, the abutments being of cast iron, tied with wrought-iron rods; or, secondly, by laying all the floors over the joists with brick or stone pavement. The staircases ought always to be of stone; and all the partitions either of that material, or of brick, or of quartering covered on both sides with tiles and cement. All the ceilings, where wooden joists are used, ought to be formed of flat tiles and cement, and all the skirtings of the same material. The roof is easily made fire-proof by being arched on the same principle as the floors of the rooms, and, like them, covered with tiles and cement. In inns so constructed, there would remain no combustible matter but the doors, the window-shutters, and the furniture. The two former might be rendered incombustible by being saturated with sulphate of iron, or coated over with a solution of silex under the paint. We are the more anxious to direct the attention of Architects to fire-proof houses, in consequence of the following communication from one of our most scientific correspondents:—"The new process for smelting iron by raw coal and hot air blast, is producing a great change in the iron trade; and it is anticipated by good judges, that no long period will elapse before cast iron of the quality known as No. 1. will be manufactured at the cost of about 40*s.* or 45*s.* the ton. When this takes place generally, it must inevitably produce an effect which will pervade almost every condition of society. Rich and poor will, by degrees, find themselves enclosed in iron cages; and fir joists, and slate roofs, will become things to be alluded to as betokening something venerable from antiquity. The introduction of iron into building operations will, no doubt, spread rapidly, as the price of cast iron falls; and, if unskilfully done at the outset, we may have a number of imperishable monuments of bad taste before our eyes wherever we go. It is, therefore, of importance that good examples should be given in time, and that Architects should be prepared for the change, so as not to leave the matter to the caprice or taste of the workmen of the founderies."

1410. *Inns and Public Houses* for the country, like private dwellings there, are of various kinds, and include various degrees of accommodation, from what is found in the small hedge alehouse, to what is afforded by the mansion inn, with its places for amusements, garden, farm, and perhaps park. In all of them the object is to provide entertainment for the public; and, consequently, the kind of accommodation afforded by the inn must be adapted to the wants of that portion of the public for whose use it is intended. Inns of every kind are the result of high civilisation, and the consequent intercourse of society by public roads, rivers, or canals. In rude countries, without roads or other regular means of communication, there can be no inns, because there can be no regular travellers. In countries imperfectly civilised, and with defective roads, the inns, like the caravanseras of Persia, or the post-houses in the interior of Russia, are little better than empty houses, or hovels, where the traveller, who carries his own bedding and provisions, may take shelter for the night. In the north of Germany and Poland, the country inns are little better. At one end of a small cottage occupied by the postmaster, or furnisher of horses for travelling, is an immense shed, closed in on the two sides, and with gateways at each end. Into this shed, the traveller drives, at the end by which he approaches; and, when he has refreshed his horses and himself, he drives out by the other. If his intention be to stop for the night, he sleeps in his carriage, or spreads the bed he has brought with him on the floor of the hovel, which, in most parts of the countries alluded to, is occupied by the horses, cows, and other live stock of the postmaster, and the horses of other travellers. On the contrary, inns in a wealthy and highly civilised country like England contain all the luxuries of a private mansion; and the traveller who stops in them, with plenty of money, may enjoy many of the comforts of home, without its cares. In other countries, such as the south of Germany and many parts of North America,

the inn is frequently a place where greater luxuries are to be obtained than in the private houses of most of the citizens. With the progress of things in all countries, this is likely to be more and more the case; for, as equality of education and rights become general, it will be followed by a comparative equality in the distribution of property; and great entertainments, such as are now given by wealthy merchants and princes, will only be obtainable by public assemblies or associations at inns. This will, in time, give rise, in every country, as it has already done in Britain, to inns of recreation and enjoyment, as well as inns of accommodation and convenience for travellers.

1411. *Inns of Recreation* seem destined to contain all the comforts and luxuries which are now almost exclusively found in the mansions and palaces of the aristocracy of Europe; as these comforts and luxuries were in ancient times only to be met with in the richer convents and monasteries. Such inns will, therefore, not be confined to in-door conveniences, but will embrace also all that can be afforded by gardens, pleasure-grounds, parks, forests, and farms; all the sports of the field, and all the games and exercises that have been known to contribute to human gratification. In one word, all that now can only be obtained by sovereign princes or the most wealthy nobles, will, by the modern system of inns of recreation, be within the reach of every one who has a little spare money and time. In ages and countries of ignorance, and of a privileged and consequently wealthy and all-grasping aristocracy, there will necessarily be many enjoyments, the very nature of which cannot be even imagined by the mass of society, much less can the spectacles displayed by them be seen; but, in an age such as we contemplate, there will not be a single enjoyment which is not within the reach of all to see and understand; and in which most of the inhabitants may not be able to participate.

1412. *The Model Designs for Inns and Alehouses*, therefore, must obviously be founded on the accommodations afforded by private houses; and this will reduce this first section to the business of laying down principles for arranging the architectural characteristics of inns; after which we shall illustrate them by a few miscellaneous Designs. It is previously necessary, however, that we repeat what we have before stated, § 701, that the subject of country inns is but a very subordinate part of our work, and that we, consequently, do not profess to give a complete treatise on the subject.

Sect. I. *General Principles for composing Model Designs for Country Inns and Public Houses.*

1413. *A complete Country Inn* may be considered with reference to its accommodation, arrangement, or distribution, its situation and architectural style. The accommodation includes that of the house, of the stable offices, and of the gardens and grounds.

1414. *The Accommodation* of the house, we have already said, is essentially that of a private house, with the housekeeper's room, or bar, placed in a conspicuous situation, instead of in a private one; and with the store-room and larder also exposed to public view. The inn contains an entrance hall, in which there ought always to be a porter to announce the arrival of guests, by ringing one bell for the hostler, and another for the waiter; an ante-room or strangers' room, into which the guests are first shown, and where they are waited on by the master, mistress, or some upper servant, to ascertain the kind of accommodation which they desire. A complete inn ought to have large rooms for parties to dine in on public occasions, or in which may be held public meetings, assemblies, balls, &c.: it ought also to have suites of apartments, consisting of one or two sitting-rooms, one or two bed-rooms, a maid-servant's or nurse's room, and a water-closet; such suites of apartments being frequently required in first-rate inns, by wealthy families who travel with their own carriages and horses, and who wish to live at an inn as privately as if they were at home. There ought also to be suites of apartments for single persons, consisting of a bed-room and sitting-room each. There ought to be small dining-rooms for small parties to dine together; and numerous bed-rooms, some with dressing-rooms, and some without them. In a large inn, there ought to be also a billiard-room for exercise and amusement during bad weather and long evenings; and also one or more musical instruments; and in every inn, whether large or small, there ought to be a library of books; which may be put under the care of the bar-woman, and lent out to guests at a small sum per volume. Among the conveniences, there should be hot, cold, saline, vapour, and air baths; and, in general, whatever is found mentioned in the first chapter of our succeeding book, as appropriate to villas.

1415. *The Bar or Office of an Inn* being its characteristic feature, it is proper that it should be shortly described: its situation ought to be central in the interior of large buildings, commanding views of the front entrance hall and back entrance; and, as far as practicable, of the foot of the principal staircase, and along the principal passages. These objects can only be obtained by having the room of some size, almost insulated by broad passages, and with windows on all sides; or having the sides formed by glazed

partitions. Considerable assistance might be afforded to the bar-woman, to enable her to see in every direction, by looking-glasses, judiciously disposed without and within the bar, as these would reflect places and persons which could not otherwise be seen. The situation of the bar, in a narrow building, may be at the end of the entrance-hall, with one side looking towards it, and the one opposite looking towards the yard. In size, the bar need never be large; because, though, in small public houses and inns, it is used as a shop or store-room, as well as an office, yet, in general, it is used in the latter capacity only. Here the books of the inn are kept, and orders given to the cook, the keeper of the cellar, the ostler, or the stable-yard keeper; and here also all monies are given in, which have been received by the different servants or waiters. Adjoining the bar there is usually the private room of the master and mistress of the house; and the larder and general store-room are commonly near, and within sight of it.

1416. *The Accommodation of the Stable-court* ought to be proportionate to that of the house. In a conspicuous situation, at the entrance to the court, there ought to be the office of the superintendent of this department, which should command a view of the interior of the stable-yard; and also, if possible, be seen from, and look to, a window in the bar-room. In very extensive country inns, the stable-yard should be a distinct part of the establishment from the farm yard, for obvious reasons; but in small establishments they may often be combined, the cattle-courts being altogether separated from the courts for post horses, travellers' horses, and carriages. The principal buildings in the stable-yard of an inn are the stables, coach-houses, and houses for corn and fodder. There ought also to be an ample harness-room, a room for boiling or steaming food for sick horses, an hospital, a shoeing-house or smithy, and a wheelwright's shop, or place for repairing carriages. There are other minor accommodations which will readily occur. In all large establishments there ought to be a riding-house; and the business of a riding-master might be very well combined with that of innkeeper.

1417. *The Accommodations in the Grounds* are first and principally a dairy, a poultry-house, and an icehouse; there ought also to be a complete farmery; a kitchen-garden, with forcing-houses; an orchard or a vineyard, according to the climate; and a large park for guests to take exercise in on horseback or in carriages, and for a herd of deer, as well as other animals for profit and pleasure, including what is called game. Near the house there ought to be lawns and pleasure-grounds for pedestrian exercise.

1418. *In Public Houses, or Inns of an inferior Description,* all these accommodations must necessarily be very limited: the park may be dispensed with; the farmery included in the stable-court; and the pleasure-ground limited to a bowling-green, tea-gardens, and place for playing at skittles or other games.

1419. *The Situation of an Inn, or Public House,* for ordinary purposes, should in general either be on or near a public road, or on the margin of a canal or river; but the particular points along roads or other lines for public conveyances on which inns should be placed are subjects which require some consideration, especially in new countries, where most people travel in stages or coaches, which stop for refreshment only at certain distances. The great object ought to be, so to arrange the stopping places, as that the inns may always be built in dry healthy situations, with extensive and agreeable prospects; we say extensive, because one object, with all travellers, is, to form some general idea of the country through which they pass. With respect to inns of recreation, it is obvious, that to place them on any other spot than one of great natural beauty can never be a voluntary act; since situation and accompaniments, much more than the plan of the dwelling, will naturally be the principal inducements to guests. Under inns of this sort, we of course include those of watering-places, baths, springs, fishing and shooting stations, and various others, which it would lead us beyond our proposed limits to describe.

1420. *The Architectural Style of an Inn* in the country may be as various as that of any dwelling-house, and there is no beauty within the whole range of cottage and villa architecture that may not be conferred on it. Indeed, as country inns on public roads are likely to be among the most permanent of country dwellings, it is very desirable, with a view to the general beauty of a country, that they should be built, not only in a substantial manner, but in a highly improved style of design. In old countries, such as Europe, it is seldom found necessary to erect a building expressly for the purpose of an inn of recreation; as there are generally mansions of decayed nobility, or convents, or other buildings belonging to wealthy individuals or public bodies, which are to be purchased at a moderate rate, with gardens and grounds, and every requisite accompaniment and appendage. Many houses of this description are in the finest natural situations which Europe affords, and their eligibility for inns of recreation is so decided, that they could not in general be turned to any other use with half the advantage. In America, the building of country inns appears to be an art yet in its infancy; but, with the progress of wealth and the improvement of manners in that country, it is pro-

bable that country inns, along the great public roads, will be almost the only permanent substantial palace-like dwellings. Our opinion is, that, with the advancement of civilisation, country inns, in all parts of the world, will, as architectural objects, rank next to buildings for public offices.

Sect. II. *Miscellaneous Designs for Country Inns and Public Houses.*

1421. *The Designs* submitted under this section embrace but a very few of the numerous varieties of inns and public houses which are suitable for the country; but, as whoever can compose a good villa is equally competent to compose a country inn, we consider the following selection amply sufficient. We have, besides, already given a Design for a country inn combined with a farm, § 1149, which we consider exceedingly well arranged; and many of our cottages in Book I. will answer, with very little alteration, for hedge alehouses.

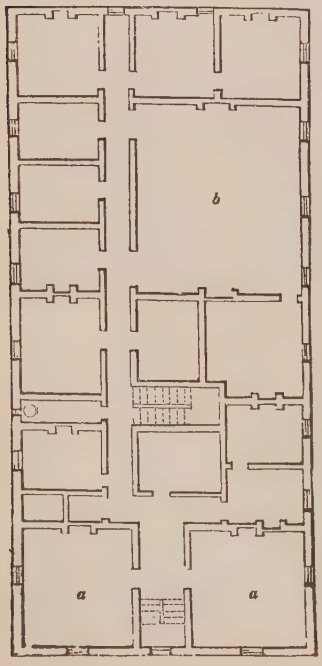
Design I. — *A Country Inn in the Italian Style; having, besides public Rooms, Thirty Bed-rooms, and Stabling for Twenty Horses.*

1422. *Accommodation.* The general appearance is shown in fig. 1295; and the

1295

ground floor, fig. 1298, consists of an entrance porch, *a*; vestibule and staircase, *b*;

1296



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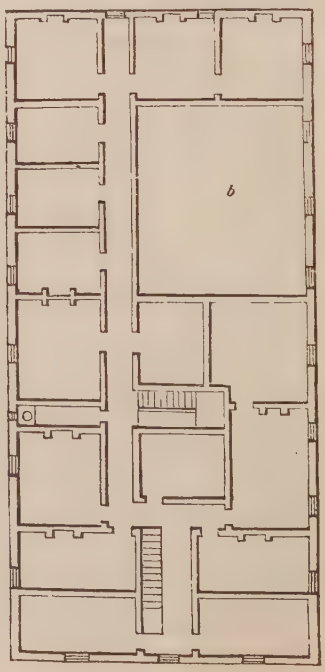

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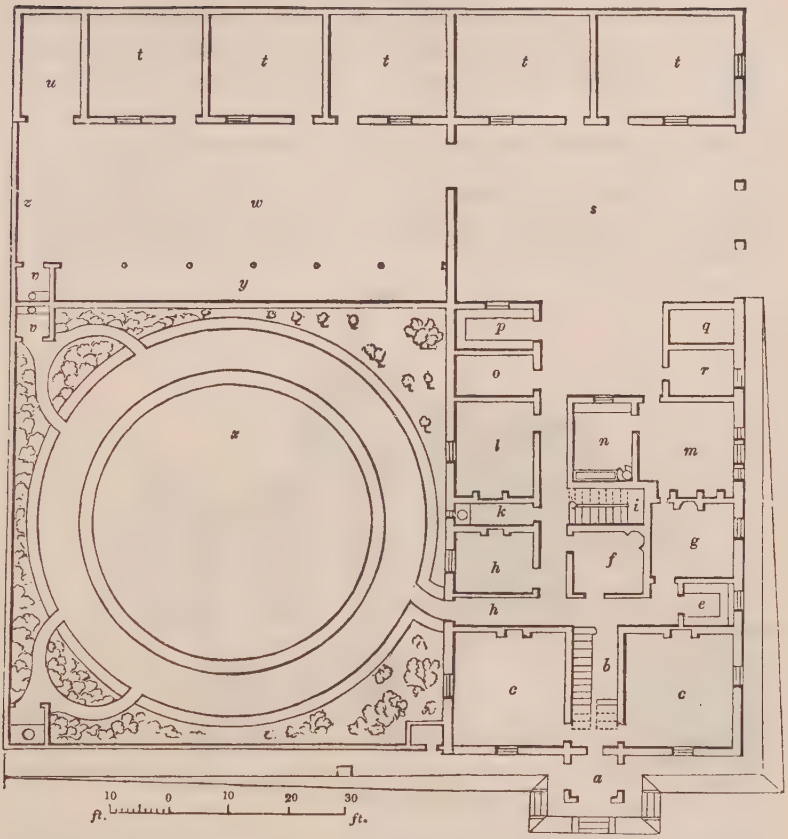


two parlours, *c*; passage, *d*, to the garden, *x*; store-room, *e*; bar, *f*; family sitting-room, *g*; back parlour, *h*; back stairs, *i*; water-closet, *k*; tap-room, *l*; kitchen, with oven and hot water boiler, *m*; back-kitchen and scullery, *n*; coal-house, *o*; larder and pantry, *p*; dust-hole, *q*; boot-closet, *r*; covered yard for gigs, chaises, &c., *s*; stables, *t t*; coach-house, *u*; privies for servants, *v v*; stable-yard, *w*; garden, *x*; veranda for skittles, *y*; and liquid manure tank, *z*. The chamber-floor, fig. 1296, has two sitting-rooms, *a a*; and a large room for balls, or public meetings, *b*; the ceiling of this last room is on a level with the ceilings of the rooms of the attic story, and is marked, in fig. 1297, by the same letters. All the other rooms in the chamber-floor and attic story, figs. 1296 and 1297 (thirty in number), are sleeping-apartments.

1423. *Construction.* The walls are supposed to be of brick, and the roof covered with Peake's Italian tiles, such as are shown in § 50 or in § 1368; the eaves being supported by wrought cantalivers. To render the bed-rooms fire-proof, the joists may be covered with plain tiles bedded in Roman cement, and having a coating over them of the same material; the tiles and cement being closely joined to the brickwork of the walls, and the skirting being formed of stucco or cement. The floors, after being made a year or more, may be washed over with oil, and painted either a plain colour or an imitation of any particular kind of wood, marble, or stone. The ceilings may be formed in the same manner. The staircases may be of cast-iron, the treads being covered with stone-plates. The garden, *x*, is shown with a circular grass-plot in the centre, and a border of evergreen and deciduous shrubs and flowers next the walls. The kitchen-garden and farm are not seen in this plan.

1424. *General Estimate.* The cubic contents of this building are 201,908 feet; which, at *5d.* per foot, is £4203 : 8*s.* : 4*d.*, the probable cost of an edifice in this style, plainly finished, in the neighbourhood of London.

1425. *Remarks.* The ground plan of this Design was contributed by Mr. Taylor, and the elevation has been supplied by Mr. Robertson. The inn seems well adapted for country business; having large rooms for meetings, a spacious covered yard for the protection of carriages of every description, and abundance of stabling. A large kitchen-garden will be required for such an establishment, unless there be a market-garden close at hand.

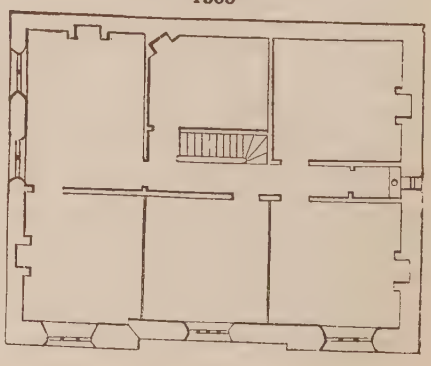
Design II. — *A small Country Inn, with Stabling, Skittle-Ground, Tea-Garden, and Bowling-Green.*

1426. *The Situation* is supposed to be in a right angle, formed by the intersection of two roads, or by a branch from one road. The principal front, which is seen in fig. 1299, is to the main road; and the stables, carriage-house, and yard open to the cross or branch road.

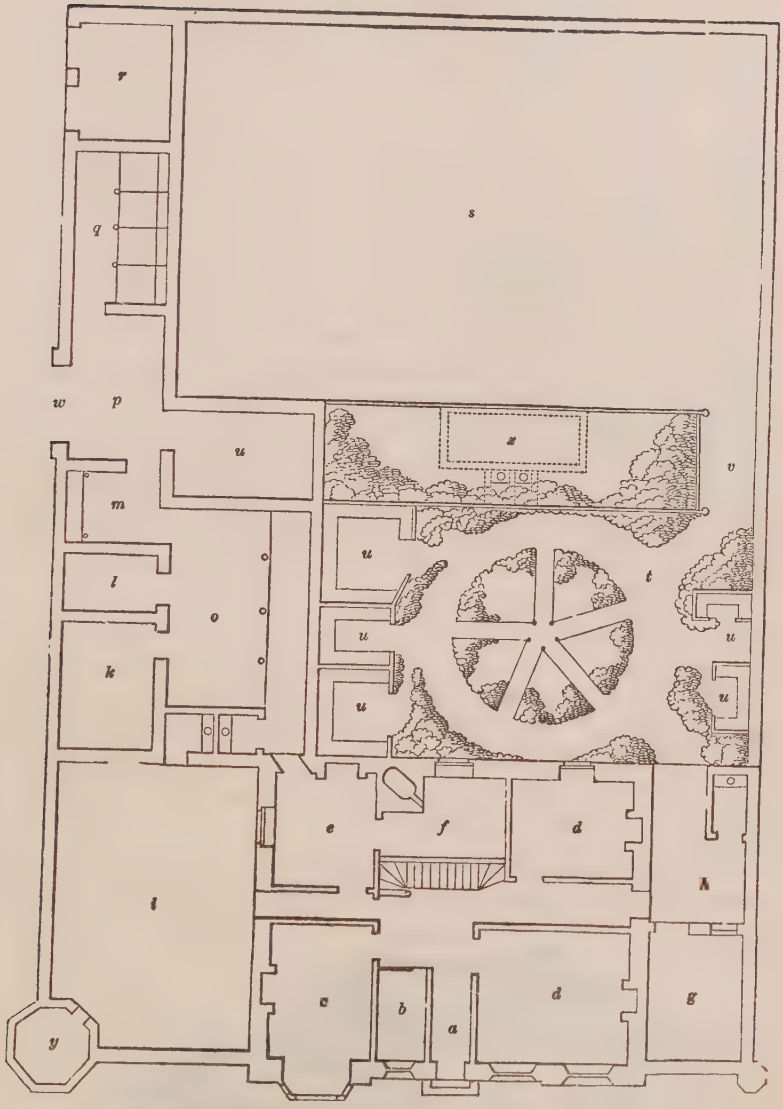
1299

1427. *Accommodation.* In fig. 1301 is an entrance passage, *a*, which leads to a hall and staircase, out of which open two other passages; that to the left, leading to the skittle-ground, *i*; and that to the right to the yard, *h*, the tea-garden, *t*, and the bowling-green, *s*. Between the passage and the tap, *c*, is the bar, *b*, which is also very conveniently situated for observing comers and goers by the different passages, and to and from the kitchen, *e*. The bar, it is to be observed, has glass windows on three sides, and the upper half of the kitchen door, and of those of the passages, is also of glass. In the back-kitchen, *f*, is an oven. There are a wine and spirit cellar, *g*; a brew-house, *k*; beer-cellar, *l*; and cow-house, *m*; and these last three buildings have a floor over them for malt, corn, hops, &c. There is a malting-house, *n*, over which, at one end, there may be a kiln for drying the malt, or this may be placed in an adjoining building in the yard, *p*. There is a stable for four horses, *q*; a place for two carriages, *r*; a bowling-green; *s*, and a tea-garden, *t*, with a fountain in the centre, and five alcoves on the sides, *u*. The chamber floor, fig. 1300, contains six good rooms, five of them with fireplaces, and a water-closet.

1300



1301



1428. *Construction.* The materials of the walls may be those in common use in the given locality; and hence they may require to be either thicker or narrower than those shown in the plan.

1429. *The Skittle-Ground* ought to be rendered hard, smooth, and perfectly level, by a composition of quicklime, sharp sand, and smithy ashes, being spread over a layer of small stones or coarse gravel, and rolled or floated so as to be perfectly smooth, before it has had time to set. We have shown this appendage, and that following, in conformity with modern usage in Britain; though we are convinced that when mankind generally are more highly educated, such childish amusements as playing at skittles will never be thought of. As to the exercise which the game affords, perhaps something may be said in its favour in crowded cities; but, even in them, exercise may surely be

obtained by means equally amusing, and, at the same time, somewhat more rational. When cities are self-governed by a regularly organised representative system, there will always be public gardens sufficiently extensive, and furnished with abundance of botanical and zoological specimens, to supply the means of agreeable exercise and recreation in walking through and examining them. We are justified in this opinion by the fact, that rude games have disappeared in all countries, in proportion as civilisation has advanced and been equalised.

1430. *The Bowling-Green* ought to be well drained, and to have gratings communicating with under-ground drains along the sides. The surface of the ground ought then to be reduced to a perfect level, and, by treading or ramming, to an equal degree of solidity; after which it should be covered with turf of uniform thickness, and afterwards well watered and rolled. It is usual to form a small gutter, about a foot broad, and three inches deep, round the margin of a bowling-green, for the purpose of receiving the water from its surface; and in the bottom of this gutter the gratings to the drains are placed. When properly drained, however, and turf from a sufficiently porous soil is used, the rain will sink down through it direct to the under drains. The nature of the soil and the drainage are important considerations to be attended to, as one of the greatest beauties of a good bowling-green is to present a dry surface immediately after rain.

1431. *The Tea-Garden* should be planted with deciduous and evergreen shrubs; taking care that the nurseryman who supplies them does not plant more than two of a sort, and that the sorts have showy and odoriferous flowers. The alcoves may be formed of trellis-work, and covered with honeysuckle, virgin's-bower, and other creeping shrubs; and, in general, where nothing else will grow, and it is desirable to have a covering of vegetation, Virginian creeper and ivy may be planted. The fountain may be of artificial stone, if real stone is found too expensive; or it may be of cast iron.

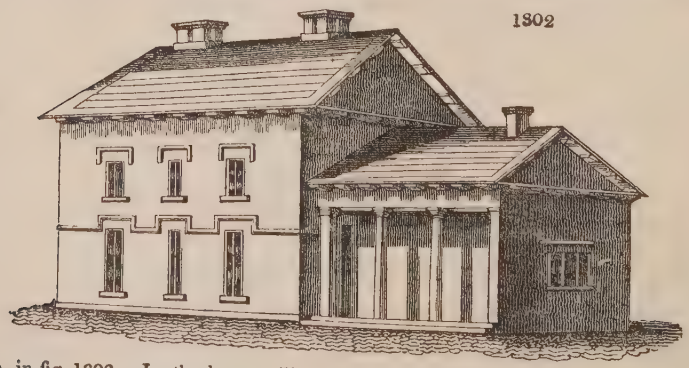
1432. *General Estimate.* The cubic contents of this building are 107,508 feet; which, at 6*d.* per foot, is £2687 : 4*s.* The extra-expense of the skittle-ground, tea-garden, and bowling-green will be at least £100, exclusive of enclosure walls, booths, the alcoves, and the fountains.

1433. *Remarks.* This Design was furnished us by William Ross, Esq., Architect, Bristol; and we consider it a very judicious arrangement, with reference to the purpose in view. The yard, *o*, may be covered; and the floor over the brewhouse and beer-cellar proportionably increased. From the passage, *v*, between the tea-garden and the bowling-green there might be a door to a large kitchen-garden, always a most valuable appendage to a country inn; as are also proper yards and buildings for pigs and poultry, rabbit-hutches, and a dovecot. These, in this case, are supposed to be placed on the other side of a lane opposite the yard gate, *w*. An elegant banqueting-room might be erected on the bowling-green, in the situation, *x*. If smoking is not permitted in the house, there is a small tower, *y*, in the skittle-ground for that purpose, independently of the alcoves in the tea-garden. The upper part of the tower, *y*, contains the pole of the signpost.

Design III. — *A small Village Inn, or Alehouse, in the Italian Gothic Manner.*

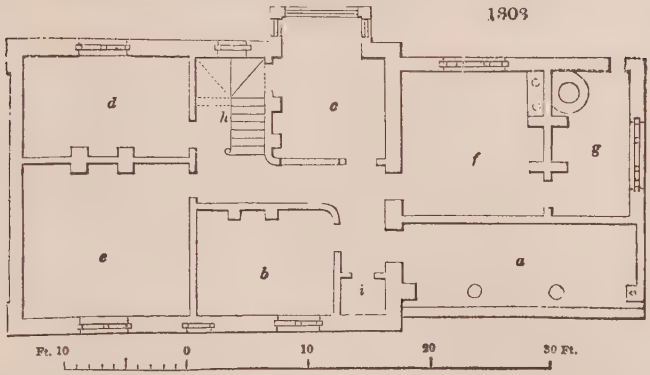
1434. *Accommodation.* The general appearance is shown in fig. 1302, and the ground

1302



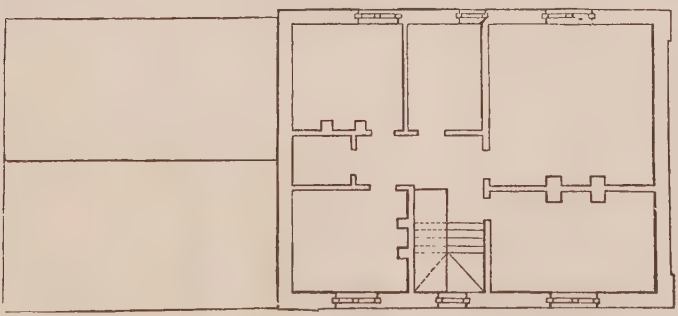
plan in fig. 1303. In the latter will be found the following rooms: *a*, a porch, or colonnade, intended for the more convenient reception of company, as also for the accommodation of the tap-room visiters, who might have seats placed there in summer; *b*, the

1303



tap-room, ten feet by eleven feet six inches; *c*, the bar, which has a projecting window, and a light into the passage; this room measures twelve feet by nine feet six inches, including the bay window; *d* and *e* are the parlours for the use of the more distinguished visiters; *f* is the kitchen, twelve feet by twelve feet; *g* is the scullery, twelve feet by seven feet six inches, which opens into the fold-yard; *h* is the staircase to communicate with the chamber story; and *i* is a small pantry, or store-closet. Cellars are supposed to be under the two parlours and the bar; and from the latter room a staircase gives access to them. In the chamber floor, fig. 1304, there are five bed-rooms and a small

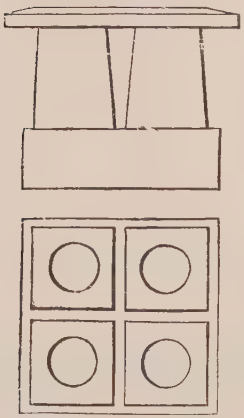
1304



closet, from which a communication may be made to servants' bed-rooms in the roof. It is not deemed necessary to show the yard and out-buildings, as the arrangement depends entirely on circumstances of a local nature; but they must, of course, include brewhouse, wash-house, stables, poultry-houses, pigsties, sheds, &c., the cost of which is not included in the estimate.

1435. *Construction.* The cellars must be sunk at least eight feet below the under side of the plinth; and the walls built of rough stone ten inches in thickness, well grouted and throughed (with cross-tie stones), with ten-inch brick arches turned over the whole. An area is to be formed for each of the windows, walled to finish, with a stone curb, rebated for an iron grate. The steps into the cellars from the bar to be common flags with brick risers. The external walls to be of stone eighteen inches thick, walled rough for stucco or sand-dashing (rough-casting). The plinth, sills, and labels to be of ashlar tooled. The internal walls to be brick, nine inches in thickness; the chimney-flues to be about ten inches in diameter, well pargeted. The shafts and caps to be wrought according to the drawing, fig. 1305, in tooled ashlar. There are to be flagged floors to the porch, tap-room, kitchen, and scullery, well-squared solid stone steps to the portico, twelve-inch tread, and seven-inch rest; there are to be six reveals to all the openings in the building, and the jambs inwards are to be splayed. Stone chimney-pieces, and cleansed (rubbed) hearths to all the rooms. The construction of the roof is simple; the internal wall is intended to rise to the ridge, therefore one pair of principals only will be required; the purlins to project in the gables, as shown in fig. 1302. The framing of the eaves is shown in fig. 1306, by which it will be seen that the spout is supported

1305



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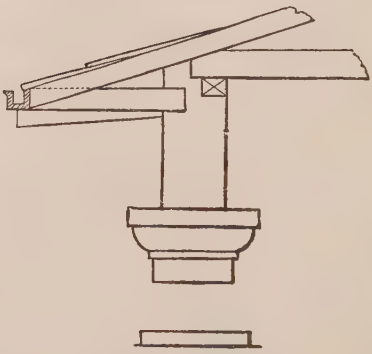
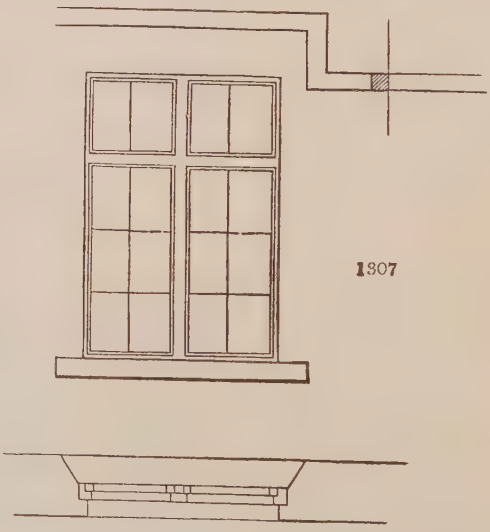


by the cantalivers, and fixed to the eaves-board. The columns of the porch are to be of oak, turned true, and having caps wrought according to the drawing, fig. 1305. A strong lintel or architrave will be required to carry the roof. There are to be one-inch boarded floors in the parlours, bar, and all the bed-rooms. The staircase to be of wood with strings, moulded nosings, turned newels, and plain balusters; there are to be six-inch torus plinths to all the rooms on the ground floor; and five-inch ditto to the chambers. The windows are to be framed as shown in the drawing, fig. 1307, with casements opening inwards, those on the ground floor having transoms; and there are to be plain splayed wood casings, with ovolo mouldings round them, to the whole. There are to be six-paneled $1\frac{1}{4}$-inch doors to all the rooms on the ground floor, with five-inch single architraves round them; there are to be four-paneled single doors to all the chambers, with plain mouldings round them. The large window in the bar is to be framed of wood, with side-lights and casements similar to the other windows. The roof is to project, and to be slated to correspond with that of the house. The plastering of the rooms on the ground floor is to be three-coat work; the ceilings on laths, and the walls stuccoed. The cornices are to be plain. The bed-rooms are to have set ceilings and two-coat walls. The exterior of the building to be rough-cast, or pebble-dashed (dashed with pebbles). The woodwork to be painted three times over. The roof to be covered with Welsh slate, fastened on with copper nails; and well pointed and made weather-proof.

1307

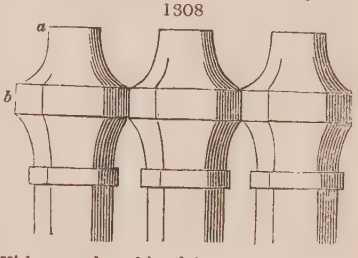


1436. *General Estimate.* The estimated cost of this erection, if executed according to this plan and particulars, and at the prices generally allowed in this part of England (Doncaster), will be about £750; to which £150 may be added for the out-offices, and fencing, planting, and laying out the site. The choice of material, the value of labour, and other local circumstances would materially alter the estimate: but the Design may

be executed in almost any part of England, in a plain and substantial manner, for the above sum.

1437. *Remarks.* "The style here attempted is Italian, the principal features of which are the Tuscan colonnade, and the projecting eaves. These, with the broad-capped chimneys, give to the house a comfortable and sheltered appearance. The windows have no decided character; but it is presumed they harmonise with the building, at least sufficiently so to produce the effect required. The site would be better if elevated on a platform; the advantages gained by which should never be overlooked, where it can be applied: but, if this erection were placed by the side of a road or street, its application would be a difficult matter. This, however, is entirely dependent upon circumstances; and, if the situation admitted it, a raised terrace should be introduced, which would add greatly to the general effect of the whole." This Design has been sent us by M. E. Hadfield, Esq., of Doncaster; and all the preceding observations are by that gentleman. All the liberty we have taken is confined to the title; and that is, to designating the inn as in the Anglo-Italian style, which we have done on account of the Gothic labels over the windows, and the mullions and transoms in them. We like the chimney-tops, though we are not sure that the projection all round them will be in favour of the draught of the chimneys: but this fault is not peculiar to Mr. Hadfield. A practical philosopher observes, on this subject, "Many of the designs for chimney-tops and pots which occur in your work appear to me to be liable to objection, from their being so massive, at the orifice of the summit, that the wind will be thrown into eddies by them; which, in chimneys of uncertain draught, may interfere with the free discharge of the smoke. I apprehend, that, whatever may be the form of termination which may be adopted for chimney-tops, the last portion of them should approach, as nearly as can be, to a thin tube, which may interfere as little as possible with the flow of the external air, which is to carry away the smoke laterally. I mean, that, whether in a simple chimney, or in a group of chimneys, the termination should be like that shown at *a* in fig. 1308, rather than that shown at *b*." These observations of our correspondent are very important; and the soundness of his opinion seems to be confirmed by the fact, that the great majority of chimney-pots, in every part of Britain, are formed of thin earthenware tubes, or tubes of iron, copper, or zinc. It must be confessed, however, that there are many broad far projecting chimney tops, for example in Switzerland, and in the lake districts of England, the flues of which appear to draw very well; and that, let a chimney be built and terminated as it will, very little can be affirmed, by the builder or Architect, till it has been tried, as to whether it will draw or not.

1308



With regard to this alehouse, as a whole, we think the interior arrangement good, and the effect not bad; though it does not possess any strong expression of style. Gothic labels, or, indeed, labels or drip mouldings of any sort, under a far-projecting roof, we disapprove of, for reasons already given, § 476.

Design IV. — *An Inn in the Italian Style.*

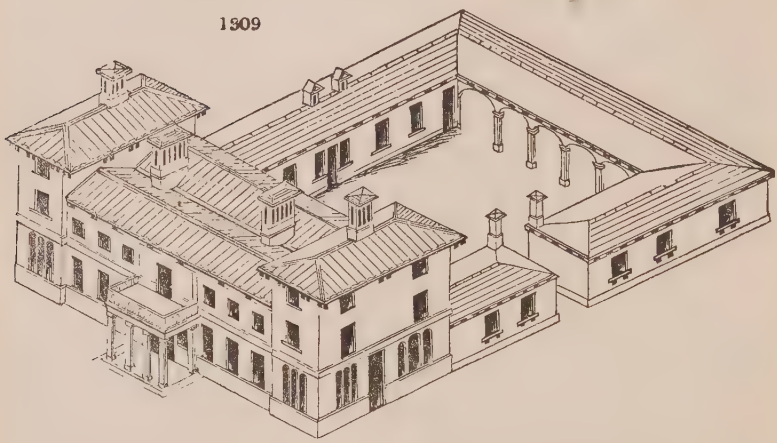
1438. *Accommodation.* The general appearance is shown is fig. 1309, and the ground plan in fig. 1310. In the latter are shown an entrance-hall, *a*; bar, *b*; kitchen, *c*; ante-room for stranger guests, before they are shown to their apartments, *d*; public room, *e*; back-kitchen, *f*; dairy, *g*; place for fattening poultry and rabbits, *h*; brewhouse, *i*; store-room, and boiling-house for horse-food, *k*; hay-room, *l*; coach-houses, *m*; foddering-bay or hay-room, *n*; pigsties, *o*; stabling for nine horses, *p*; assembly-rooms, *q*, *r*; and ante-room, *s*.

1439. *Construction.* The walls may be of brick or stone; the floors of cast-iron girders, tied and braced with wrought iron, supporting flat brick arches; and the roof of iron framing, covered with Peake's Grecian tiles.

1440. *General Estimate.* The cubic contents of this building are 221,940 feet; which, at 6*d.* per foot, will give, as a guess price, £5548 : 10*s.*

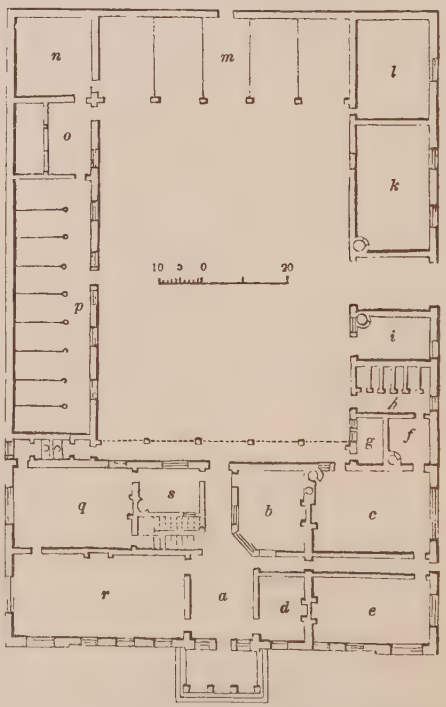
1441. *Remarks.* The plan of this inn is from the portfolio of Mr. Kempshot, a London Architect, who has built numerous public houses, and also some country churches, and one or two mausoleums. The elevation is by Mr. Robertson, and we think that our readers will agree with us in opinion that it does him great credit. There is one point in which this Design is deficient, but which might be very easily remedied; and that is, there is no place to drive under, and take up or set down company, during

1309



heavy rains. In all inns whatever, we would have the main entrance either under an archway to the yard or court, or under such a porch or portico as would admit of a carriage of the largest size. We have experienced the great comfort of carriage entrances of this kind, both in inns and in private houses on the Continent; and we are surprised that Architects, who have travelled, should not have introduced them more generally in this country. We do not recommend that archways through the building, with apartments over them, should be adopted as substitutes for projecting porticoes: these, where they occur, we would rather consider as adjuncts, to be used when two carriages chanced to arrive or depart at the same time. What we should wish to see would be bold projecting porticoes, or Gothic porches, form a prominent part of the front, such as we see to some villa residences. Three of these, which occur to our recollection at this moment, are Lord Winchelsea's, in Kent, for a Grecian example; Eaton Hall, for a carriage-porch in the Gothic style; and General St. John's cottage, in Sussex, for a carriage-porch in the old English cottage style. The ground plan does not show the wings, which may consist of two rooms and a passage on each floor.

1310



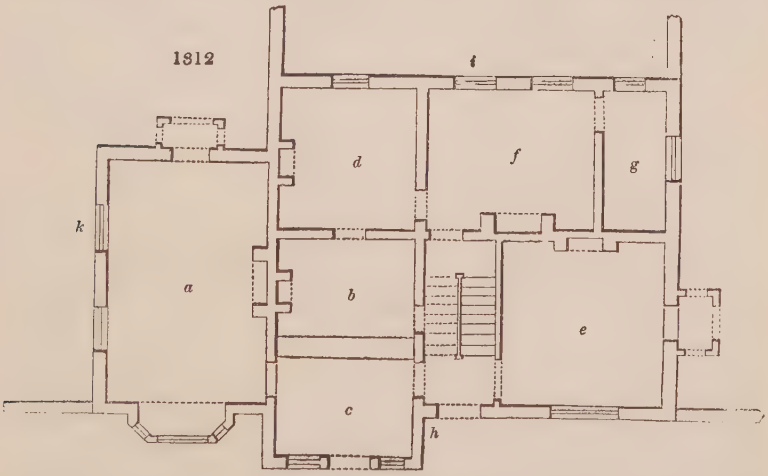
Design V. — *A Suburban Public House in the Old English Style.*

1442. *The principal object* of this Design is to show the arrangement of the bar and counter in those public houses which are supported chiefly by the sale of liquors in small quantities, either drunk in the shop, standing at the counter, or carried home in brought vessels by the purchasers. The general appearance of this house is shown in fig. 1311.

1311

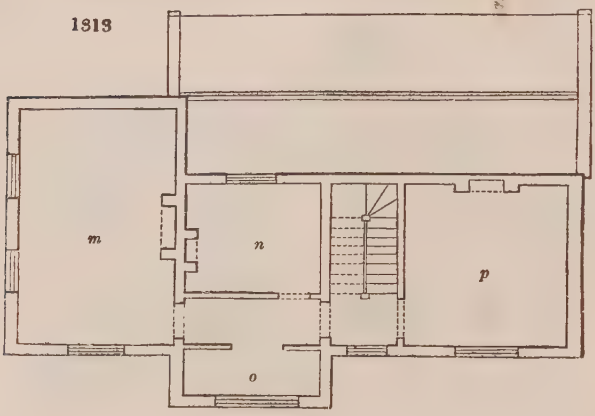
1443. *Accommodation.* The ground plan, fig. 1312, shows a tap-room, *a*, thirteen feet by twenty feet, with a porch to a skittle-ground behind; a bar, *b*, with a counter separating it from the shop, or place for standing customers, *c*: *d* is the bar parlour for

1312



the master and mistress; *e*, a company parlour, with a porch to a garden containing a bowling-green, quoit-ground, cricket-ground, swimming-pond, and baths; *f* is the kitchen; and *g*, the pantry. The main entrance is at *h*; the house yard and its offices are at *i*; the skittle-ground and the garden for the tap-room company are at *k*; and the gardens for the parlour company at *l*. Fig. 1313 is the plan of the chamber or one pair story, showing a club-room, *m*; a waiting-room or bed-room, *n*; a room for hats, great-coats, and other conveniences connected with the club, *o*; and best bed-room, *p*. The basement story is similar in plan: in it, *m* is a beer-cellar; *n*, a store-cellar; *o*, a coal-cellar; and *p*, a spirit and wine-cellar. Fig. 1314 is the plan of the attics, showing three good bed-rooms with fireplaces and presses. Fig. 1315 is a perspective view of the bar room, which is eleven feet six inches by ten feet, and ten feet high, with a fireplace for a stove on one side, a door opposite, and another door in the back as seen in the ground plan, fig. 1312, *b*. The view is taken looking towards the bar from the shop, *c*, and supposing the counter, fig. 1316, to be removed. In this view, *a* shows small casks for gin, brandy, rum, and other spirituous liquors simple or compound, holding from ten to twenty gallons each, for retail sale, chiefly in single glasses. The casks are supplied sometimes from the bar-room by means of a small forcing-pump, or by a can called a jack, but more frequently through a trap-hole in the floor of the room above; from which hole, a

1313



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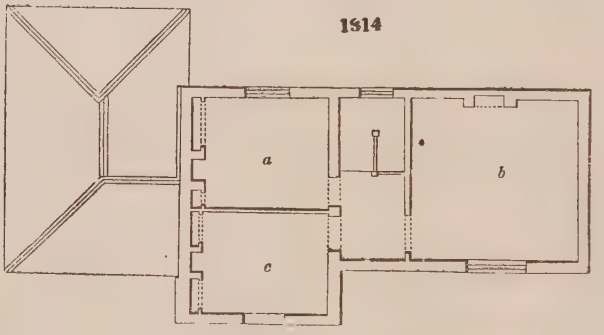

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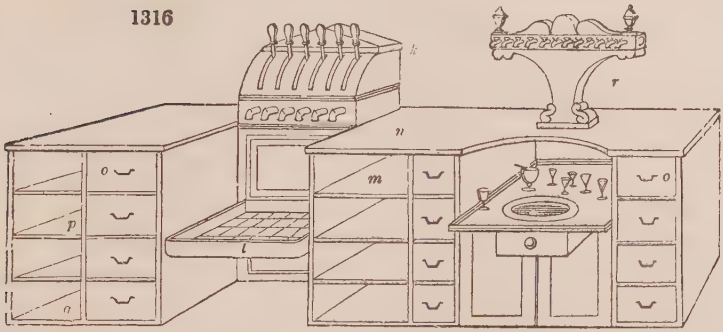
1316

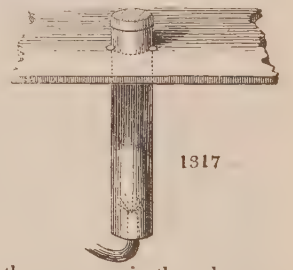


flexible tube is conducted to each particular cask. The liquor is supplied to what is called the fountain, on the counter (*r*, fig. 1316), by pipes, which communicate with the casks, and are connected with them by means of union joints (that is, male and female screws, with a nut generally of brass). The pipes are brought down in a case or trunk against the wall, are led along the back of the counter close under its top, and are afterwards carried up the hollow column of the fountain, in the upper part of which they are united to the different cocks by which the liquors are drawn off. There are store vats, *b b*, for such liquors as are sold in larger quantities, and these are drawn directly from the vats by cocks. There are bins for wine and liqueurs kept in bottles, which bins are here shown with the doors shut at *c*; at *d* are shelves for glasses and similar articles; at *e*, shelves for pewter or stone pots for beer, ale, &c.; at *f* are pigeonholes for bottles containing choice compounds, cordials, &c.; and at *g*, cupboards for various articles; *h* is a fireplace, with a boiler for hot water round three sides, and a cock to draw it off for constant use; and *i* is the case or trunk, containing the pipes which lead from the upper casks to the counter fountain. Fig. 1316 is a view of the inside of the counter, looking from the bar-room, in which *k* is a six-motion beer-machine to draw the beer and ale of different ages and qualities from the butts in the cellar. Beneath this machine, at *l*, is a projecting tray, the bottom of which is formed of a grating, or of a pierced plate of pewter, the holes being about the eighth of an inch in diameter; over this the beer is drawn into the pots, and the droppings are collected by this grating, and passed down, by means of a tube, to a vat in the cellar. This waste beer is taken back by the brewers, and an equal quantity of new beer given in exchange; at *m* are shelves for glasses, liquor measures, &c.; at *n* is usually placed a portable apparatus for heating elder wine, gin and ale, or other liquors; it consists of a funnel connected with a worm tube, which passes through a vessel filled with hot water; the water is sometimes kept hot by an iron heater like that of an urn, or a spirit lamp; and at other times, by a tube connected with the boiler at the back or sides of the kitchen fire. Sometimes there are two funnels and worms, so that two sorts of liquor can be warmed at once. To warm the liquor, it is poured into one of the funnels at top, and in about half a minute it is drawn off by a cock at bottom; the length of the worm in the hot water allowing time for the latter to communicate its heat during the passage of the wine through it. There are drawers, *o*, for tobacco, cheese, biscuits, sugar, lemons, &c.; places for bread and other articles, *p*; a recess for pipes, *q*; and a fountain, *r*, with twelve cocks, connected with the small casks, *a*, in fig. 1315, and with a basin and water for rinsing glasses below. In some places this basin is supplied with two cocks, one for hot and the other for cold water, with a waste-plug and chain in the bottom of the basin; and in others there is, immediately beneath the fountain, a saveall, or pierced plate of pewter, through which the drippings from the glasses percolate, and are collected in a shallow basin below, from which they are taken out occasionally, and sold at a low price to the poorer customers, or given away in charity. All the wood-work of this counter is mahogany, and the metal is pewter, with the exception of the cocks, which are sometimes of brass, though pewter is considered preferable, as being less liable to corrode.

1444. *Remarks.* For this Design we are indebted to Mr. Laxton, who has had great experience in fitting up public houses. We may observe here, that the fitting up of public house bars in London forms almost a distinct trade; and that the expense incurred in this way by the owners of public houses is almost incredible, every one vying with his neighbour in convenient arrangement, general display, rich carving, brass-work, finely veined mahogany, and ornamental painting. The carving of one ornament alone, in that of Mr. Weller, the Grapes, in Old-street Road, cost £100; the work-

manship was by one of the first carvers in wood in London. Three public houses, or rather gin-shops, have been lately fitted up in Lamb's Conduit Street, at an expense, for the bar alone, of upwards of £2000 each. We have no doubt, however, that progressive improvements will be made, even in these bars. The fireplace, for example, is a clumsy mode of heating water, in an apartment where there is but little room to spare. In every town and village where gas is laid on, not only in bars but in kitchens, the heating of water, and various operations of cookery, might be readily effected without the aid of common fires in any form. A correspondent has sent us the following important communication on this subject, to which we invite the attention of all who live in localities where gas can be obtained.

1445. *Heating Water and cooking by Gas.* "Mr. Strutt, many years ago, affirmed that coal gas, properly applied, would be the cheapest fuel for cooking. This has been so fully confirmed by late trials here (Edinburgh), that I have no doubt that, in all cases when it can be had, it should form part of the arrangement of a working man's dwelling, to have the means of so applying it. The plan, which has succeeded here, is as follows: a case or tube of thin rolled iron is made of about two feet, or two feet and a half, long, with a soldered joint; its diameter may be from three inches to ten inches, according to the use it is to be put to. Over the mouth of this a piece of wire gauze, of about forty-five wires to the inch, is fixed by an iron hoop: from the sides of the tube, close to the hoop, three pieces of iron are made to project, by means of which the tube may be supported by the edges of a circular hole in a table or shelf, shown by the dotted circle n fig. 1317. When so placed, if gas be admitted at the lower extremity of the case or tube, it will mix with the common air within it; and, the mixture being lighter than the common air, it will rise and pass through the meshes of the wire gauze. If the mixture be set fire to *above the gauze*, it will continue to burn there, without igniting what is below it; and, although the flame gives scarcely any light, it gives out great heat, and quickly boils any fluid in a vessel placed on a stand two inches over it. Cases of three or four inches diameter answer well for tea-kettles, sauce or stew pans; and one of nine or ten inches is fully sufficient for a large fish-kettle, or a round of beef, or for sending off steam to heat a bath. The consumption of gas of such a stove costs, at the prices charged here for gas, about $\frac{1}{2}d.$ an hour. To use the gas conveniently and economically in such an apparatus, each gas branch should be furnished with two stopcocks, one of which only should be accessible to the cook: by the other, the workman who fixes the apparatus should regulate the maximum quantity of gas which can pass when the accessible cock is fully opened. The cook will then have the power of diminishing and shutting off the gas, but not of admitting an undue quantity. The point for regulating is the *commencement* of the appearance of yellow flame on the tip of the blue cone. If more gas be admitted after this, carbon is deposited on the bottoms of the cooking-vessels, from the combustion not being completed; while, if the due proportion be observed, the cooking may be performed in bright-bottomed vessels without sensibly tarnishing them. If these gas stoves be placed in the surface of a table, the sides and ends should be boxed up from the under side of the table nearly to the ground, to prevent disturbing currents of air from interfering with the regular rise of the gas mixture in the cases."



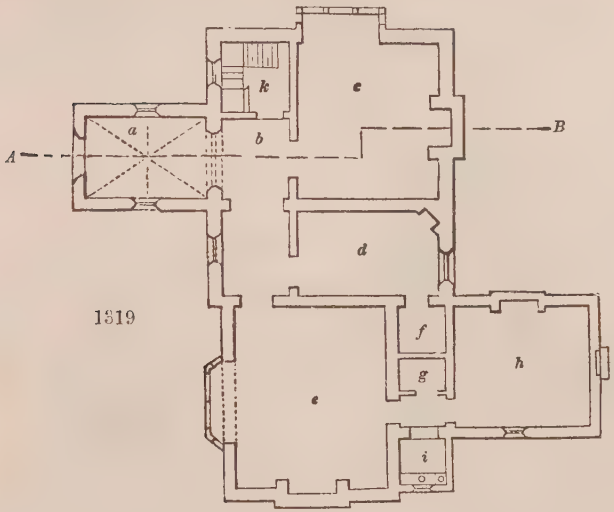
1317

Design VI. — *A Hedge Alehouse of the smallest Size.*

1446. *The general Appearance* is shown in the perspective view, fig. 1318, and the ground plan in fig. 1319. The latter, to a scale of one inch to nineteen feet,

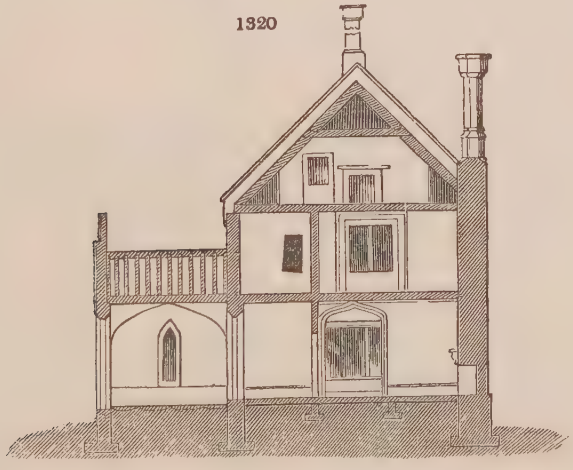
1318

1319



contains a porch, *a*; vestibule, *b*; tap-room and kitchen, *c*; bar, having a command of the tap-room and parlour, by borrowed lights on both sides, *d*; parlour, *e*; pantry, *f*; china-closet, *g*; master's bed-room, *h*; and water-closet, *i*. There is a staircase, *k*, to the floor above, which contains three good bed-rooms; over which, and over the parlour, are garrets. Two of these garret bed-rooms have fireplaces, as shown in the section A B fig. 1320.

1320



1447. *Construction.* The walls are supposed to be of brick, the chimney tops of artificial stone, and the roofing of grey slate.

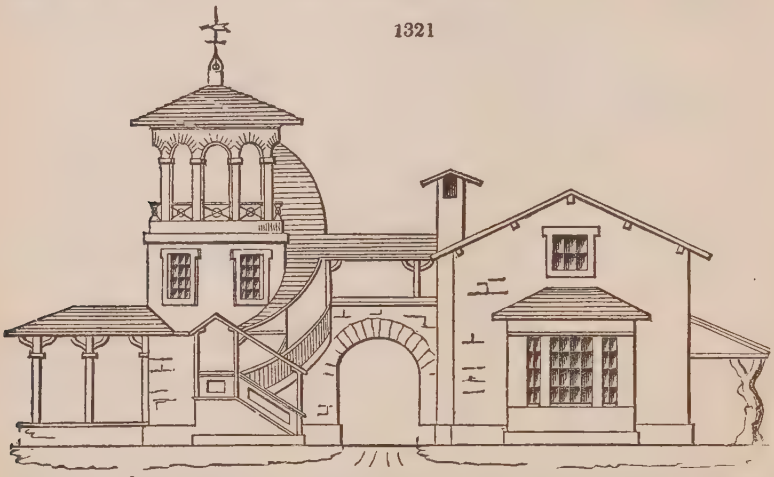
1448. *General Estimate.* Cubic contents, 27,634 feet; which, at 4*d.* per foot, is £460 : 11*s.* : 4*d.*

1449. *Remarks.* This Design is also by Mr. Ross of Bristol, and seems good in point of arrangement; though Mr. Ross suggests that it might be an improvement if the bar and staircase were to change places. It would make a very comfortable private cottage, *d* being a store-room, instead of a bar, and the other places remaining in their present state; unless, indeed, the large porch, *a*, were made a green-house, or aviary, or place for sculpture, antiquities, or a museum.

Design VII. — *A Country Public House in the Italian Style.*

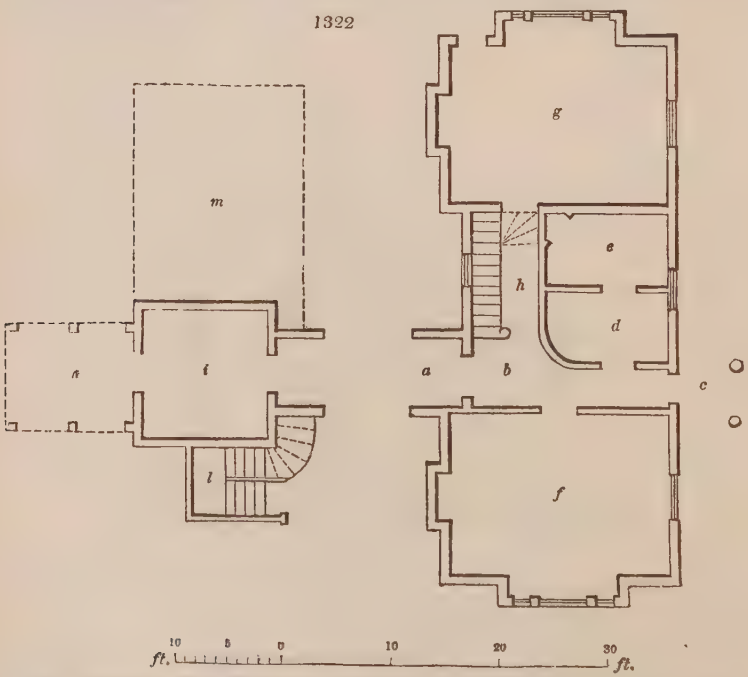
1450. *Accommodation.* The general appearance is shown in the elevation, fig. 1321, and the ground plan in fig. 1322, which contains a carriage entrance, *a*, with a passage, *b*

1321



between it and an entrance-porch, *c*. There are a bar, *d*; bar-room, *e*; parlour, *f*; kitchen, *g*; staircase, *h*; small parlour, *i*; loggia or place for drinking in, *k*; and outside staircase to rooms for company in the upper part of the tower, which is circular, and also over part of the house.

1322

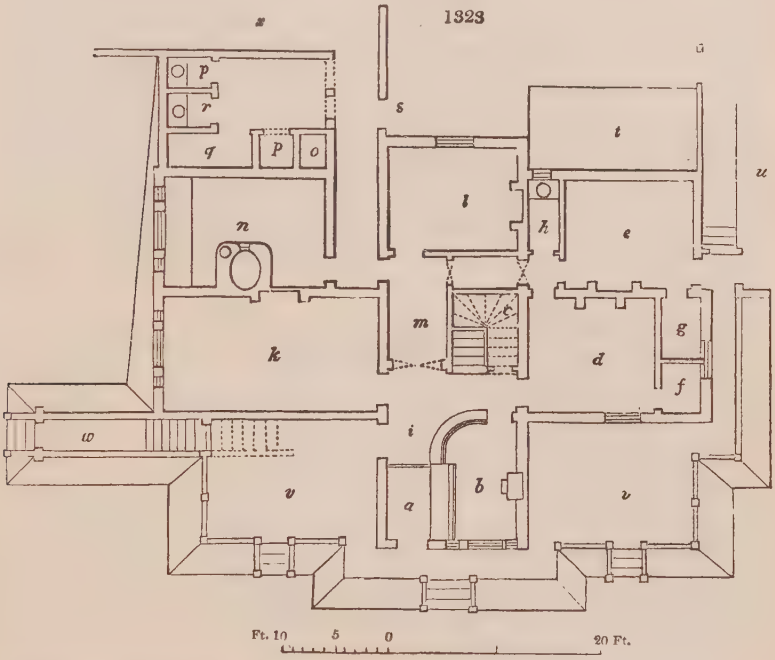


1451. *Remarks.* This Design has been sent us by Edward Buckton Lamb, Esq. Architect. As an elevation, it is very picturesque, and well calculated for a public house of recreation in a country commanding fine views. The carriage entrance is a most desirable feature, and, as already observed, § 1441, ought never to be omitted.

Design VIII.—*A small Inn or Public House in the Swiss Style.*

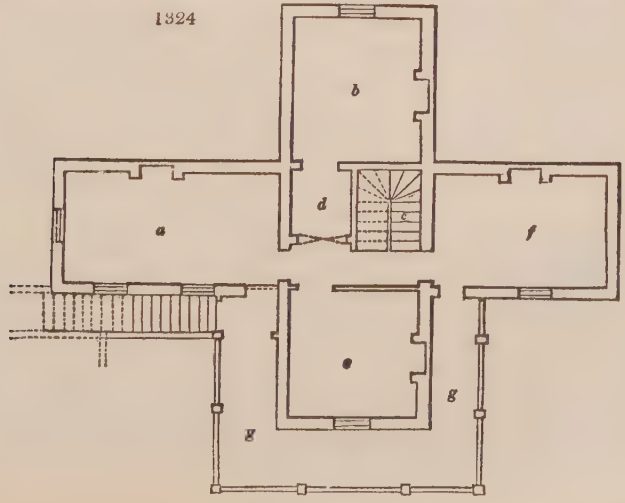
1452. *Accommodation.* The ground plan, fig. 1323, consists of an entrance to the bar, *a*; bar, *b*; cellar, *c*; family parlour, *d*; kitchen, *e*; store-closet, *f*; pantry, *g*; water-closet, *h*; entrance lobby *i*; tap-room, *k*; public parlour, *l*; lobby, *m*; bakehouse, *n*;

1323



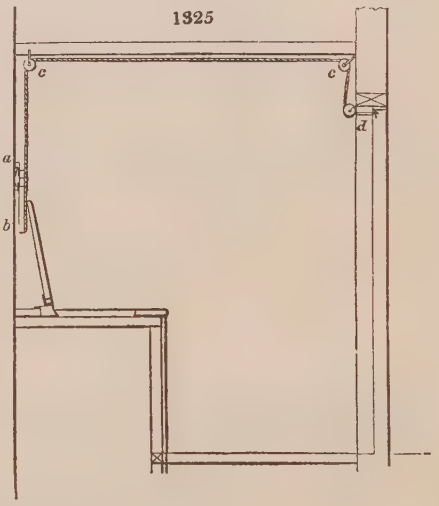
dust-hole, *o*; wood-house, *p*; coal-house, *q*; privies, *r r*; entrance to cricket and quoit ground, *s*; situation of the baths, *t*; garden, *u*; terrace, *v v*; terraced walk to the stairs leading to the balcony, *w*; skittle-ground, *x*. The first floor consists of a club-room, fig. 1324, *a*; large bed-room, *b*; staircase, *c*; lobby, *d*; bed-room, *e*; family bed-room *f*; terrace, *g g*. There is one large bed-room and two small ones in the attic floor.

1324



1453. *Construction.* The foundations are to be built of stone or brickwork, and carried up two feet above the level of the terrace; the walls containing the flues and the chimney stacks are also to be of stone or brickwork. The platform on which the terrace is raised is to be formed of the earth dug out of the foundations; and, after being properly rammed, and allowed time to settle, it is to be paved with flat tiles. The railings surrounding the terrace are to be formed by wooden posts driven firmly into the platform at the angles, and the intermediate spaces are to be filled in with roughly turned balusters, coped with a light wooden rail. The balconies to be supported by wooden brackets, as shown in the elevation; and the balusters of the outside stairs are to correspond with those of the terrace. The walls above the solid stone or brickwork are to be framed of wood in the Swiss manner, and covered with boards both outside and inside. The roof is to be covered with shingles or with tiles, and the projecting eaves are to be supported by brackets, and by a continuation of the common rafters; the projections over the gable ends are also to be supported by solid wooden brackets. The tops of the chimney shafts are to be covered with tarred boards, or with thin flag-stones; and the smoke is to escape at the lateral openings, as shown in the elevation. The ornaments on the roof are to be of very light cast iron, painted of an oak colour. The windows may be common sashes, hung in the usual way; or they may be framed in the Italian or Swiss manner, and hinged so as to open inwards. The oven is to be built of fire bricks, having the joints radiating to centres. All the ornamental woodwork to be roughly carved and notched with the axe and chisel. The water-closet and privies are to be lined with $\frac{3}{8}$-inch deal two feet above the seats, and are to have proper pans, traps, and drains. The inconvenience often occasioned by leaving the lid of the seat off, may be remedied by the following very simple contrivance, shown by fig. 1325. Immediately behind the lid, when up, let a small fillet of wood be hinged by a piece of leather at the upper end, *a*, and a cord fixed at its lower end, *b*, passing over the pulleys fixed in the ceiling at *c c*, to the door, *d*. It will be seen that if the door be opened outwards, the cord passing over the pulleys raises the fillet of wood, and if the lid has been left open, it throws it down with such force as not only to correct the omission, but to make every one in the house aware of it.

1325



1454. *Remarks.* "The terraces in front may have seats for the accommodation of those who wish to sit in the open air; and the balcony may be a comfortable retreat in mild rainy weather, being well protected by the projecting roof; it will also be a very convenient place for invalids. A stove is shown in the bar, both for warming the apartment, and for keeping water hot to mix with the liquors. The bar or shop, at *a*, is for retailing liquors to those who are to carry them away; and a temporary division is thrown across the bar, to separate the shop department from the company passing into the lobby, *i*. The platform opposite the bar communicates with the terraces on each side, and a walk is shown from the terrace opposite the family parlour, passing through the porch, and descending a few steps to the garden, *v*. The garden may also be entered by the kitchen, *e*, and also through the cricket-ground, *s*. The bar, the family parlour, and the kitchen, are arranged as near to each other as possible, for the sake of convenience; and an additional door is made to enter into this parlour close by the kitchen door, both to prevent the inconvenience of carrying hot dishes through the lobby, *m*, and to afford more private access to the water-closet, *h*. The covered yard in front of the privies will be found very useful in keeping the skittles and quoits from the weather when not in use. Warm, cold, and shower baths may be erected at *t*; and swimming-ponds, surrounded by boarding, may be made at the extremity of the cricket-ground. If more cellarage be required than the small cellar, *c*, cellars might be made under the tap-room and family parlour, descending by a staircase where the present cellar is shown. The club-room, *a*, may be used as a room for public meetings; and, at election time, it

might be used as a committee-room, at which times the balcony would be a suitable place from which the candidates might deliver their opinions to the electors. The outside entrance staircase will be found a very convenient means of access to the club-room, and will prevent company from being annoyed by those who may be enjoying themselves on the terrace in front. If this building were situated in a district where there were no scientific institutions, the club-room might be occasionally used as a place for delivering lectures in to a small company, on mechanics and chemistry, and other branches of experimental philosophy; and, in this case, the room over the bar might be used as a reading-room or library. It would, however, be preferable to have a regular mechanics' institution, that would accommodate a greater number of persons, if the inhabitants could afford to support such an institution; and the possibility of this being made a lecture-room is only suggested in order that refreshments for the body and mind might be supplied in the same quarter, to suit the various tastes of various individuals." This Design, and the preceding description and remarks, have been composed by Mr. Robertson; and we think they do credit to his judgment in arrangement, and his taste in composing

1326

elevations. Its general appearance, fig. 1326, reminds us of the very beautiful wine-house and pleasure-garden, in the Swiss style, at Silberberg, near Stuttgard.

SECT. III. *Of the Finishing, Fittings-up, Fixtures, and Furniture of Country Inns and Public Houses.*

1455. *The Finishing, Fittings-up, and Fixtures of Inns* differ from those of private houses chiefly in the extent of those belonging to the kitchen and its offices; and the peculiarity of those required for the bar. We shall take in succession the bar, the kitchen, and the store-room, larder, and other offices.

SUBSECT. 1. *Of the Finishing, Fittings-up, Fixtures, and Furniture of the Bar of an Inn or Public House.*

1456. *The Finishing and Fittings-up of the Bar* include, in large inns, an iron safe or chest, for books, valuable papers, and money; pigeonholes, marked with the letters of the alphabet, for letters, accounts, and general purposes; and other pigeonholes, marked with the numbers of all the different apartments, for letters or other articles left for, or belonging to, any of the guests. In small inns, there is a cupboard for glass and china, together with drawers and shelves for tea and coffee urns, tea-pots, coffee-pots, and punch bowls, and a variety of miscellaneous articles; there are also vertical divisions for tea-trays, waiters, and similar things: and, in public houses, there is a supply of hot and cold water from cocks over a sink; and, as we have seen, Design V, § 1443, a complete system of tubes or pipes, for drawing liquors from casks, either in the bar-room, in an adjoining room, or in the cellar beneath. In presses and drawers in the bar are also kept, in the smaller inns, the table linen, napery, and plate of every description. Some years ago, an invention was exhibited in London, called a domestic telegraph, which was considered to be well adapted for very large inns. A dial, with a face like that of a clock, but with the names of the articles most in use in coffee-rooms inscribed round the plate, instead of the figures of the hours, and with a hand

to point to the articles required, was fixed up in the coffee-room or in the bar, and was united by wires and machinery with a corresponding dial in the kitchen. The movement of the hands being sympathetic, orders were thus communicated from the one to the other, a bell being previously rung to direct attention. Speaking pipes, however, are much better adapted for this purpose, though either can seldom be wanted in a country inn. A bell to the kitchen, another to the stables, a third for the waiter, and a fourth for the chambermaid, are indispensable in the bars of large inns; but in small ones, a bell for the hostler, and another for the head waiter, are deemed sufficient.

1457. *Rising Cupboards.* There is a contrivance, in some coffee-houses in London, for sending up articles from the kitchen to the bar, or to any other upper room, in a vertical tube or trunk. This is effected in two ways. The first is by a single box, or cupboard, suspended by a cord and pulleys, and balanced by a weight, as in fig. 1327, in which *a* is the box or cupboard, with a shelf in the middle; *b b*, two pulleys, over which the cord passes which is attached to the lid of the box at one end, and to the mass of iron, *c*, of equivalent weight, at the other; *d* is a wooden rod, attached by a piece of cord, or two or three links of a chain, to a staple in the bottom of the box, by which the person in the kitchen below pulls it down, or pushes it up; *e* is the top of the counter of the bar; and *f* the surface of the bar floor. In some cases the cupboard is balanced by two weights, one on each side, when the centre pulley becomes unnecessary, and the top of the cupboard, on which articles may be placed, rises to the level of the surface of the counter, or of any table to which the apparatus may be affixed, so as to appear a part of

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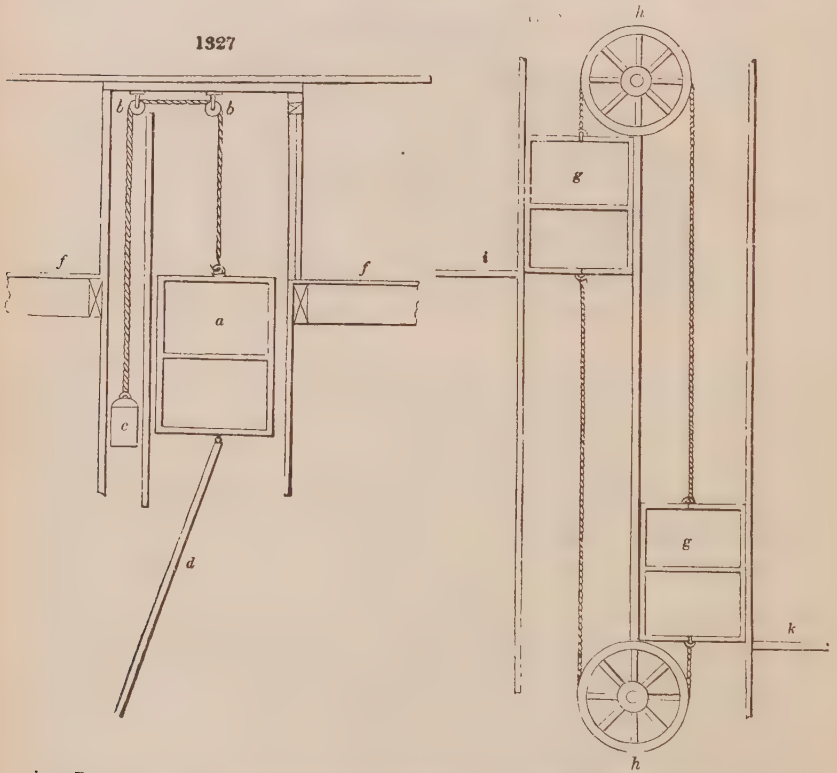

it. By the second mode there are two cupboards, fig. 1328, *g g*, which balance each other, and are attached by cords, fastened to staples in the exterior surfaces of the tops and bottoms of each cupboard. These cords run on the two cast-iron wheels, *h h*, each of which is about twenty inches in diameter, and the cupboards are so placed as that, when one is at the top of the trunk, or place of delivery, *i*, the other is at the bottom, or place of reception, *k*. In order that the cupboards may move up and down with perfect ease and steadiness, two beads or fillets are nailed on each of their exterior sides, as in fig. 1329, at *l l*; and grooves are formed in the sides of the trunk, by fillets nailed on, as

1329

at *m m*. When the second description of rising cupboard is used, it is necessary to have one for each floor; but the former kind may serve all the floors of a house, openings being made at the proper height in each floor, for a person to put in his hands in order to take out, or to put in, articles, and to move the cord either upwards or downwards, as may be required. The second mode is much the most convenient for large inns; but the first is sufficient for small ones. One of the cupboards, in fig. 1328, is supposed to contain the principal dishes of a single course; and while the other is at the bottom, ready to receive the dishes of the second course from the kitchen, it is at the sideboard in the dining-room, or in any other convenient place near it, for receiving and taking down the empty dishes. Fig. 1327 may be seen in action at the shop of Mr. Rope, Confectioner, in Lamb's Conduit Street; and fig. 1328, adapted both to the ground floor and the first floor, at the Albion Tavern, Drury Lane Theatre. The latter was constructed by Mr. Argent, Bricklayer and Carpenter, Seabright Place, Hackney Road, and is found to save a great deal of labour in carrying the dishes up and down stairs, besides keeping the articles hot. Indeed, by having a cast-iron plate, heated by steam, at the bottom of each trunk, it may be rendered a hot closet, for all its length; and, when the apparatus of the rising cupboard is not used, it might serve for conveying heat from the kitchen to the upper rooms. In some inns the cupboard is raised or lowered at pleasure by a cord and pulley, operated on by a rack and pinion in the kitchen; orders being given by the waiter above through a speaking-tube, and attention being directed to the tube by the waiter in the bar or upper room first ringing a bell. In some eating-houses, in London, the tube is circular, and about a foot in diameter, that size being sufficient for sending up dinners for individuals in two or three covers placed one over another; but in inns where large parties are given, the tubes are two or three feet square, and the boxes, which move up and down in them, are fitted up with shelves, and may be kept perfectly hot by a vessel of hot water or an iron heater being placed in the lowest shelf. The tubes in which these boxes move are generally formed alongside the staircase. In some private houses in Russia, for example, at Astankina, near Moscow, there is, or was, when we saw it, in 1814, a contrivance for the descent and return of the entire dining-table to and from the kitchen; the dining-table, in this case, being surrounded by a fixed margin, on which the wine was kept. This also can, however, be seldom wanted in a country inn, where the kitchen may almost always be on the same floor with the principal dining-rooms. A horizontal tube, or hot tunnel, with grooves for a small carriage like a railway waggon, to be drawn from one end to the other by cords, one at each end, for conveying the dinner from the kitchen to a distant part of the house, may possibly, in some cases, be wanted, and could easily be constructed along the side of a straight passage.

1458. *Among the Fixtures of the Bar* may be included a folding register grate, which costs, in London, £7 : 7*s*., and is one of the best things of the kind in use either for a bar, a library, or any other room where valuable papers are kept; or for a sick-room, or nursery, or even for common bed-rooms, where the expense is not an object. The doors of this stove are in two parts, the upper and the lower; and each part consists of four divisions, which are hinged to each other, and fold back so as to present the appearance of fig. 1330 when not in use. When it is desired to blow the fire, after being newly lighted, or if it gets low, the upper half of the doors may be shut, as in fig. 1331. On the other hand, when the fire burns too rapidly, or it is not wanted, the lower doors may be shut; which, by excluding the draught of air through the fuel, will prevent combustion. On leaving the room at any time, or on retiring to

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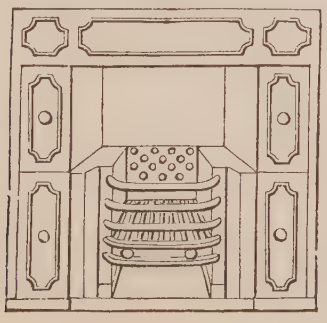

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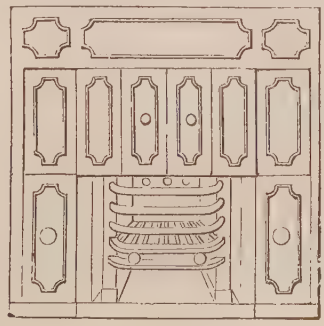
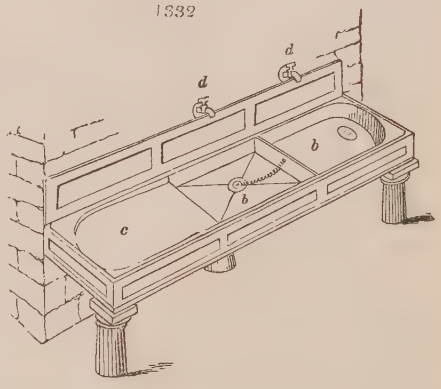


bed, all the doors may be wholly or partially closed, so as to put out the fire, or keep it barely alive. This description of stove has also the farther advantages, that it increases the draught of slow-drawing or smoky chimneys; and that, in summer, when fires are not wanted, it may be shut close, to prevent the descent of air from the chimney into the room. By filling in the panels of the shutters with talc instead of iron, a very perfect description of fireplace might be formed; and, while many of the advantages of a close stove might be obtained, the English prejudices in favour of the sight of the fire might still be gratified. This might also be done, and, at the same time, safety and ventilation insured, if the panels were filled in with brass wire.

1459. *In the Scullery or Back-Kitchen* of an inn, a large sink will be required, of which there are numerous convenient kinds made in cast iron. Fig. 1332 is manufactured by Mr. Mallet of Dublin. It has three divisions: *a* is a common sink, from which the water or other fluid runs away without impediment through the adjacent column or support; *b* is a trough, which may be filled with water for washing vegetables, and which is furnished with a plug and waste-pipe at bottom; *c* is an inclined plane grooved on the surface, for draining vegetables, fish, &c.; and *d d* are cocks for supplying water. Side-tables or dressers, either in the kitchen or scullery, or in any of the other apartments connected with them, may be fixed to the wall, and supported by cast-iron brackets, fig. 1333, in the manner recommended for cottage and farm furniture.

1332



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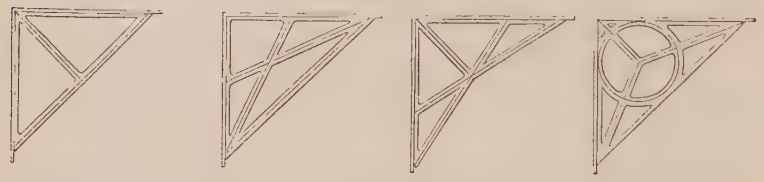

Kitchen tables are generally formed of the wood of the ash, as being white, hard, and durable.

Subsect. 2. *Of the Finishing, Fittings-up, Fixtures, and Furniture for the other Offices of Inns.*

1460. *The general Store-room* is fitted up with large presses and drawers for the bed-room linen and for furniture, such as curtains, table-covers, &c., not in common use. The carpets, mats, and floorcloths of different descriptions are kept in closets on the particular floors to which they belong. In the general store-room are also kept all groceries, and other dry goods usually purchased in large quantities. Coffee, pepper, and spice mills are fixtures generally placed here, or, in small inns, in the bar-room. A napkin press, fig. 1334, is one of the most useful articles of inn furniture, since table-cloths, napkins, towels, &c., after having been used, but not soiled, if neatly folded and pressed, may be made to look as if newly washed and mangled.

1461. *The Larder* ought to be in a cool shady situation, and should be well ventilated by windows or other openings on, at least, two sides, covered with wire or haircloths; and also by openings or flues from the ceiling or top of the side walls, conducted to the side of some chimney, in which there is constantly kept a fire; in order that the heat of the smoke flue, by passing through to the air flue, may create a continual draught through the larder. In complete inns, there are separate larders for butcher's meat, fresh and cooked, venison, game, fish, and even vegetables: there ought also to be a salting-room, and a house for smoking hams, tongues, &c. The fish larder has a well or cistern for ice, in which fish are kept during summer, with troughs of water for

live eels, and cisterns for feeding oysters, and also for crawfish. In summer, the fish is kept on a table under a case of fine wirecloth, that it may be seen, for the purpose of selection, by guests, without uncovering it to admit the flies. Cold meat, and also raw meat for steaks and chops are covered in a similar manner in some of the London larders. The vegetable larder, as we have already observed, § 737, ought, if convenient, to be near the ice-house. In addition to larders for preserving these different kinds of provisions, there ought also to be a cellar or other place for intenerating such meat as may be required to be dressed before it has hung the usual time. As coating poultry or butcher's meat with yeast, or rubbing it over with, or immersing it in, charcoal, tends to freshen it when it has been kept too long, so burying it in earth, by accelerating putrefaction, serves to render it tender. It is well known, that a fowl of any kind, not many hours killed, if buried five or six hours in common garden soil, becomes as tender as if it had been kept above ground two or three days. Fowls newly killed, and dressed before they are cold (savagelike though the practice is), are always perfectly tender; as are also all the internal parts of animals. Hanging fowls or meat in the shade of a fig tree, or any tree of the same natural order, is also found to make them tender. Nettles belong to the same natural order; and it is said that slices of meat, such as beefsteaks, &c., rubbed over with nettle leaves, or laid on and covered with them, will become quite tender in a few hours.

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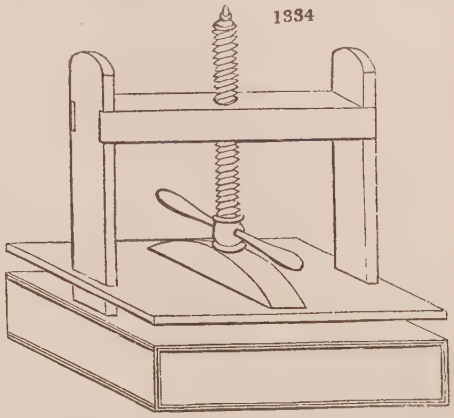

1462. *The Fittings-up of the Cellars of Inns* have nothing peculiar. Cast-iron bins for wines have been employed in London, to save room; but, as they are not so durable as brick or stone, they are not approved of in cases where there is abundance of space. It is also said that the effect which the changes of temperature produce upon iron has some influence on the state of port wine stored in iron bins, it being well known that this wine is more liable to be rendered muddy by cold than any other.

1463. *The Cellar Furniture for an Inn* includes a machine for racking wine from one cask to another, of which there are various sorts; one, recently invented by Mr. Hilton, is figured and described in the *Trans. of the Soc. of Arts*, vol. xlviii. p. 70: and a machine for bottling wine; one of which has been invented by Mr. Masterman of London, by which a number of bottles may be filled at the same time, and this with such rapidity, that six dozen of common quart bottles may be filled in ten minutes. The same gentleman has also invented a machine for corking five or six bottles at a time; so that, in extensive concerns, the business of bottling and corking may be reduced to a tenth part of the usual labour. Both machines cost very little; they will be found figured and described in the *Repertory of Arts*, new series, vol. i.; and the bottling-machine, which is a very beautiful and effective apparatus, may be seen in operation in the extensive wine vaults of Carbonell and Company, Regent Street, London. The common bottling-machine we have already given, § 1324, fig. 1189. An improved mode of preserving beer from souring has been invented by our correspondent, Mr. Mallet of Dublin, which is well deserving the attention of those who know what it is to drink table beer charged with carbonic acid gas. By Mr. Mallet's apparatus the external air is not only completely excluded, but the beer may be impregnated with gas, as in the manufacture of soda water. The cost is little more than that of the patent vent peg. (See *Mech. Mag.* vol. xv. p. 264.)

1464. *A Washing and Wringing Machine* for a farm house has been already given; and we shall now recommend one for an inn, which is in use in the Derbyshire Infirmary and in other establishments. This machine may either be turned by manual labour, by a horse, or by steam; and as, in a large inn, a steam-engine of one-horse power might always be combined with the steam apparatus for other purposes, it might be employed for driving different kinds of machinery, such as a washing-machine, a churn, a straw-cutter, oat-bruiser, &c. It has been remarked to us by a correspondent, who has paid great attention to the subject of domestic economy, that the machine we are about to describe is the only one he ever saw which did no injury to linen. It was adapted

by Mr. William Strutt, from the common washing-wheel; and is thus described in *Sylvester's Domestic Economy*: — "Two sides of the wash-house are provided with stone benches. In the centre of the room is a boiler, containing 100 gallons of water, and near it stands the washing-machine. There are also several wooden tubs for the purpose of washing by hand occasionally. Fig. 1335 is a perspective view of the washing-machine; *c d* is a water-tight cistern, in which the cylinder *a* revolves. The interior of this cylinder is divided into four revolvers. One quarter of the end of the cylinder is removed in the figure, to show the interior of one of these cavities. The proper entrances into these are by small doors, of which there is one in each, as seen at *h*: here the linen is introduced, and the doors are then closed. The perforations in the cylinder, and in the separations of the cavities, are for the admission of water; the linen is wetted, and rubbed with soap, the night before washing. Before the operation commences, as much cold water is put into the outer vessel, *c d*, as will rise to the height of four or five inches in the cylinder, *a*. The vessel, *c d*, is provided with a steam-pipe from the steam-engine boiler. The steam is let in until the water and linen are heated to the maximum, which is something below the boiling point. The part *b* being turned down, the inner cylinder is put in motion, and the holes in its sides freely admit the hot water and steam. The velocity of the cylinder should be such that the linen may be heard to fall from one side to the other every time it is raised out of the water. This discharges most of the water from it, and it becomes filled with a fresh portion every time it dips into the water below. If the motion be too rapid, the linen remains against the sides of the cylinder; if too slow, it slides down the sides. In either case, little or no effect is produced.* When the machine moves at a proper speed, one change of linen will be washed in less than half an hour. It must be observed, that during this process the quantity of soap in the machine should be such as to produce a strong lather; so that, if a sufficient quantity has not been rubbed upon the clothes before they were put into the machine, more soap must be added, either in the state of thin shavings, or previously dissolved in hot water. A great advantage will be derived from the use of an alkali, when it is used in a proper state, and with caution. The operation of the machine consists merely in letting the clothes fall from one side of the compartment to the other, so that the texture is less injured than by any other mode of washing, and the water, being nearly at the boiling point, has a much greater effect in dissolving the dirt, than at the low temperature which can be borne by the hand of the washerwoman. The dirty water may be let off in a few seconds by a cock in the bottom of the fixed vessel, which may be immediately supplied with fresh water, and with steam to heat it. All the labour of lading the dirty water out, and pouring fresh water in, is saved by pipes being laid for its admission and exit; and the constant supply of steam renders the presence of fireplaces unnecessary. After the clothes are removed from the machine, some of them require to be looked over, and sometimes a little hand-washing is necessary; but the greatest proportion are finished by the machine alone. The next process is boiling the clothes, which is performed in the boiler above mentioned: it is placed in the middle of the wash-house, for the purpose of getting round it. There are three pipes attached to it: one introduces cold water, a second steam, and a third carries the waste water away. During the boiling process, the boiler is covered; the edge of the cover fits into a groove, which goes round the top of the boiler. This groove, being filled with water, prevents the escape of steam, and by that means economises the heat. The linen is now taken from the boiler, and laid upon a board or tray, filled with small holes, and placed over the boiler; by which means the water, which contains much soap, is drained out, and used for the process of washing in the machine. Near the ceiling of the wash-house, there is an opening into a chimney, which is for the express purpose of carrying off the vapour." (*Sylvester's Philosophy of Domestic Economy*, p. 27.)

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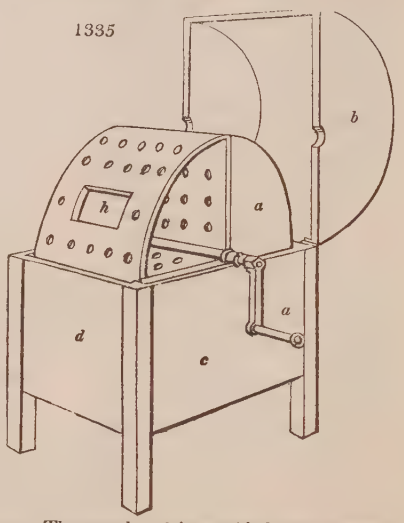
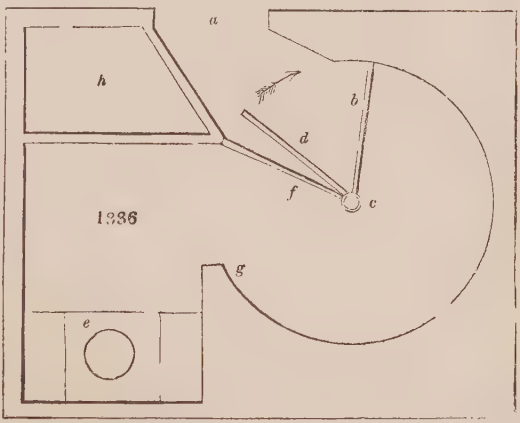


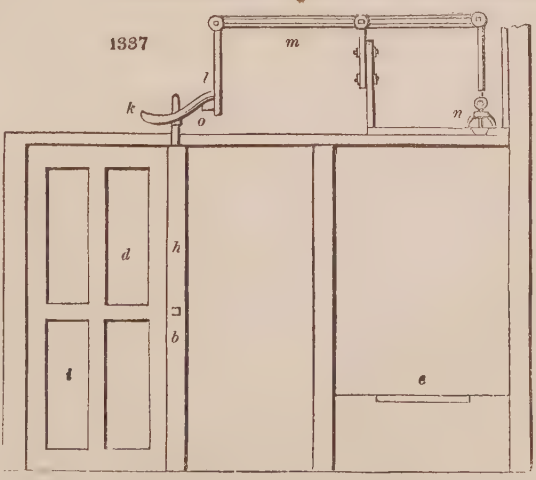
1465. *The Mode of Wringing is as follows*: — "The linen is placed in a square bag of strong sacking, kept open by wire rings; this bag is contained in a cast-iron box, which

opens on one side to admit the linen, and then closes firmly. The interior surface of the box is grooved, to receive the water when pressed out. The pressure is applied by means of a sliding plate, which fits the box, and is forced against the end of the bag by a rack and pinion, and turned by a winch. The sides of box prevent the bag from becoming wider; the pressure applied has therefore the effect of shortening the bag, till all the water is pressed out into the grooves. By this machine, the clothes are squeezed much drier than by the common method; and, the pressure upon all parts being uniform, less injury is done to the texture of the linen." (*Ibid.* p. 62.)

1466. *In the Laundry of an Inn* there might be a drying-closet, heated either by steam or by a hot-air stove, in the very superior manner described by Mr. Sylvester, as being in use in the Derbyshire Infirmary. Instead of the cockle employed in that institution, a furnace and flues, the latter of cast iron, might be made use of. In this case, the flues might be arranged in the manner adopted by Mr. Read in his hop-kiln, § 1272, the convolutions being brought into a space not exceeding the area of the bottom of the drying-closet. On this subject we refer our readers to the drying-closet which we have already given, § 306, and to that described in the work of Mr. Sylvester.

1467. *For the Water-closet of the Kitchen Courts and Stable Courts of Inns*, we should recommend the very excellent plan adopted in the Derbyshire Infirmary, and thus described by Mr. Sylvester: — "The great superiority of this water-closet above all others is, its preventing any smell, without the least care of the person using it. The person who enters it fills it with fresh air, which is left behind on coming out. The manner in which this is effected we shall now explain. Fig. 1336 is a plan of the water-closet: *a*, the entrance into the first part; *b* is a door attached to, and turning upon the arbor (a spindle or axis) *c*, which is shown more at large at the same letter in fig. 1338; *d* is a bar of wood inserted into the same, and having the same radius with the door. By pushing against the door, which from top to bottom fits the concave cylindrical space, the air is driven before *d*, and escapes at the ceiling over the seat, *e*; by this motion the door is brought up to the wooden division, *f*, and the end of the bar, *d*, is brought to the point *g*; *h* is a small closet, made for the purpose of reducing the space in front of the seat to what is sufficient room. When the person returns, he is obliged to push the bar, *d*, which now is in the position *c g*, before him, till he brings it close against the other side of *f*. During the returning motion, one of the panels of the door, *i*, in fig. 1337, is made a valve, and, opening inwards, lets in fresh air to supply the place of that driven out on entering the closet. At one particular





point in returning, the arbor *c*, in fig. 1338, gives motion to certain machinery, which lets the water through the seat in the same manner as in the common water-closet. Indeed, the seat part of this closet is the same, in every respect, as those invented by Bramah; by which the water is made to flow by raising a lever. The construction of this part is shown in fig. 1337. The arbor *c*, in fig. 1338, by its motion carries round the wheel, *k l*, which, in entering the closet, does not act upon the lever, *m*, but raises it on its return, and opens the valve, *n*, which allows the water above to descend through the seat, *e*. It will be seen by examining the wheel, *k l*, which is better seen in fig. 1338, how it affects the lever on its return only. The part *l*, to a certain extent, towards *k*, is a steel spring, which bends upwards; so that, if the wheel be moving from *k* towards *l*, the part *l* will go over the pulley, *o*, and when it gets to the protuberance at *k*, the lever, *m*, will be pulled down, the valve, *n*, raised, and the water will flow till the protuberance at *k* passes over. When the closet is entered, the opposite side of the wheel passes under the pulley, *o*, and, moving from *k* to *l*, the spring is bent downwards, and the lever, *m*, is not acted upon. The cylindrical cavity is formed of brickwork, and plastered inside. The plaster, while wet, is scraped by the door, which gives it its proper cylindrical shape." (*Phil. of Dom. Econ.* p. 49.) This water-closet, we are informed by Mr. Sylvester, was invented by Mr. William Strutt, in the year 1806; and it has been in use in his own family, and in those of several of his friends, ever since. We agree with Mr. Sylvester, in thinking it the most perfect of all water-closets; because, besides answering completely the intention of a water-closet, it does so independently of any care of the person using it, and is not likely to go easily out of repair, unless it is so placed as to admit of the water being frozen during very cold weather. In thus noticing it, we cannot help expressing our admiration of the genius and the benevolent mind of Mr. Strutt, and also paying a tribute to the memory of the late amiable and scientific engineer, Mr. Sylvester, who has so ably portrayed Mr. Strutt's inventions, in a work which ought to be in the hands of every Architect and furnishing ironmonger.

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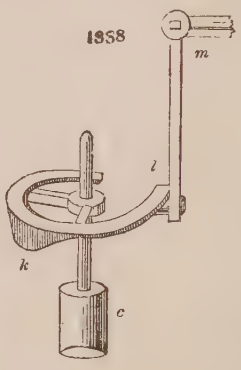

1468. *A Cleaning House or Shed* is essential to the kitchen court of every inn; and perhaps no part of such establishments stands more in want of improvement. We refer, for hints on this subject, to what we have said when treating of the interior finishing of the kitchen court of farm houses, § 1384 and § 1385.

1469. *Other Details* for the fittings-up and furniture of this department of Country Inns will be found in the corresponding sections in Book I.; and under Farm House Finishing, Fittings-up, Fixtures, and Furniture, § 1371.

Subsect. 3. *Of the Finishing, Fittings-up, Fixtures, and Furniture of the Inn generally.*

1470. *All Inns on a large Scale* ought, in our opinion, to be heated by steam, hot water, or hot air. The last mode is much better adapted for an hospital, a college, or a large dwelling-house, than an inn; because, in the former cases, it is supposed that the whole house is to be regularly heated, whereas in the latter, only one room will require to be heated at a time, as guests arrive. For this purpose, steam and hot water, especially the former, are much better adapted than hot air. By having proper vessels for containing steam in every apartment, they may be filled with it from the steam apparatus in the kitchen, a few moments after the arrival of every guest; and these vessels may, in like manner, be deprived of their steam at the instant of his departure. As the same instantaneous effect could not be produced by the hot-water system of heating, and would occasion too much expense by the hot-air system, we necessarily arrive at the conclusion, that heating by steam is the mode best adapted for inns and public houses, in countries where heating by common stoves is not adopted.

1471. *When an Inn is to be heated by common cast-iron Stoves*, decidedly the best, in our opinion, is that of Mr. Nott, recently brought into notice. When once lighted and filled with coal, it requires no more attention during twelve hours: it consumes its own smoke, shows the fire through a window of talc, and gives out a continued moderate heat, never so intense as to decompose the water held in suspension in the air, but always sufficient to keep a room warm. The two important features in this stove, by which it

effects so much with so little fuel, are, that it is lined with fire-brick, and that the ignited fuel is protected from the sudden rushing in of cold air by a grating which may be compared to that of a safety lamp. The display of the burning fuel through a window of talc is a happy mode of meeting half-way the prejudices of Englishmen in favour of an open fire.

1472. *The general Lighting of an Inn by Gas* seems an improvement suited to the progress of the age; and perhaps, when the art is brought to a greater degree of perfection than it now is, the consumption of gas in sitting-rooms may be no more objectionable than the consumption of oil or tallow. At all events, it seems highly desirable that the outside lamps, halls, passages, staircases, and public rooms should be lighted by gas; and this by creating a demand for gas for lighting, will lead to its use for cooking also.

1473. *The general System of Bells and Speaking-Pipes* for an inn requires the consideration of the Architect in planning the building. Where the edifice is a cube or a parallelogram, great simplicity, and at the same time efficiency, may be obtained by conducting all the principal vertical wires in one trunk, and all the horizontal ones in another, in the upper part of the house; but when there is great irregularity in the outline of the ground plan, and the height of different parts of the elevation, all that the Architect can do is to trust to the ingenuity of the bell-hanger. Speaking-pipes, as we have before observed, are chiefly for the use of the master and his domestics.

1474. *In lofty Inns*, we have often thought that it might be desirable to have an ascending and descending platform, on the principle of the ascending and descending cupboards or waiters, § 1457; not only for the ascent and descent of domestics, but even for guests. Such a platform was constructed by the late General Bentham, in the Panopticon erected for the Empress Catherine at Petersburgh; and we have ascended and descended it with an incredibly small degree of exertion. The principle might be easily applied to inns, and we leave it to the ingenious Architect to do so.

1475. *Water*, both hot and cold, may easily be supplied to all the rooms of an inn, by having two cisterns sufficiently elevated, in any part under the roof, where they will be protected from the frost. The water in one of these cisterns may be heated by steam, and there may be a pipe from each cistern into every bed-room, terminating over a wash-hand stand, with a waste pipe attached. It is not desirable, however, to take the supply for the lower rooms from cisterns of a greater height than one story above them; because, when taken from a greater height, the pressure of the water on the cocks soon occasions leakage. The best mode is, to have cisterns on each story for the use of that immediately underneath; and one close under the roof, for the supply of the garrets. It is interesting to reflect on the very small amount of manual labour which would be required in an inn where all the roasting was performed in a roaster, or by gas, or in one of Perkins's hot-water ovens; all the rooms heated by steam, and supplied by hot and cold water pipes, not only over a wash-hand basin, but over a seat, fitted also with a waste pipe, to serve for a water-closet; all the passages and public rooms lighted by gas; and all the heavy operations, such as pumping, churning, washing, wringing, mangling, kneading, mincing, pounding, chopping, brushing, cleaning shoes, knives and forks, &c., done by a one-horse steam-engine. A great step in the progress of civilisation will be gained by dispensing altogether with the out-door labours of females, and diminishing, as much as possible, the severity of their in-door services. No enjoyment, from the sight of a polished parlour grate, can compensate to us for the painful thought of the quantity of female labour which has been employed every morning to maintain its brightness.

1476. *One or more Bath Rooms* ought to be formed in every chamber floor in a country inn. The bath, which should be placed in a recess, or on one side of the room, for the convenience of having the water-cocks fixed to the wall, should have one supply pipe for hot, and another for cold water, with a waste pipe in the bottom; and all the three should be of easy access by the bather. The size of the vessel should not be less than six feet long, two feet and a half wide at the top, and two feet wide at bottom. It may be formed of cast iron, in one piece; of wrought-iron plates, riveted together; of copper brazed; or of wood, lined with lead. Of whatever material it is made, the inside should be painted of a light marble colour, and the outside cased with wood, painted and otherwise finished in a style to correspond with the rest of the room. There may be one broad step formed by the side of the bath, to facilitate getting into it; and over it, about two feet from the head, a cord firmly fixed to the ceiling should be suspended, with a cross piece of wood for the bather to hold by, when letting himself down into the water, or raising himself out of it. The same room should also contain a shower bath, which, by means of a grated bottom, having a pipe communicating with the steam apparatus, may also serve as a steam or vapour bath.

1477. *Among the Fixtures and Furniture for the public Rooms of an Inn* may be enumerated the Anglo-American stove, which, by projecting several feet into the room, throws out a great deal of heat, and yet shows the fire, and draws well. In the tap-

rooms and commoner rooms of country inns, considerable economy and great durability might be insured, by employing either sideboards and tables, wholly of cast iron, or boards fixed to a wall, and supported by cast-iron feet or brackets. All stationary

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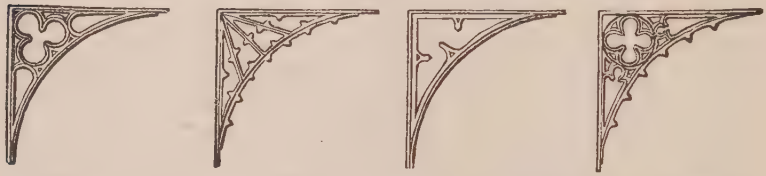

tables and seats in taverns and coffee-houses may be supported by cast-iron in ornamental shapes, bronzed; and this is already becoming frequent in London. The Albion Tavern, at Drury Lane Theatre, may be referred to as an example. Fig. 1339 shows

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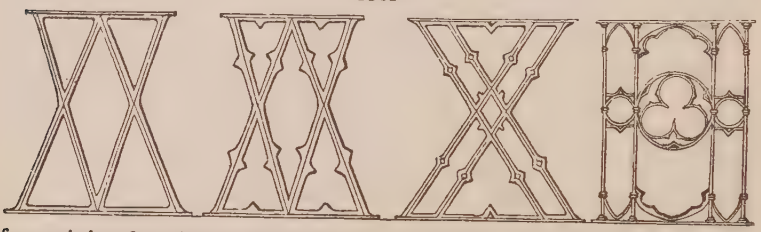

four varieties of cast-iron brackets for this purpose; and figs. 1340 and 1341 show eight varieties of Gothic framing as supports for independent tables. The manner in which

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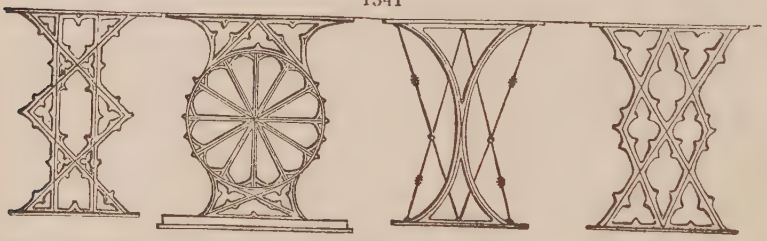

these supports are screwed to the under sides of the tables, so as to brace and support them in all directions, is shown in fig. 1342. Figs. 1343 and 1344 are iron chairs, also

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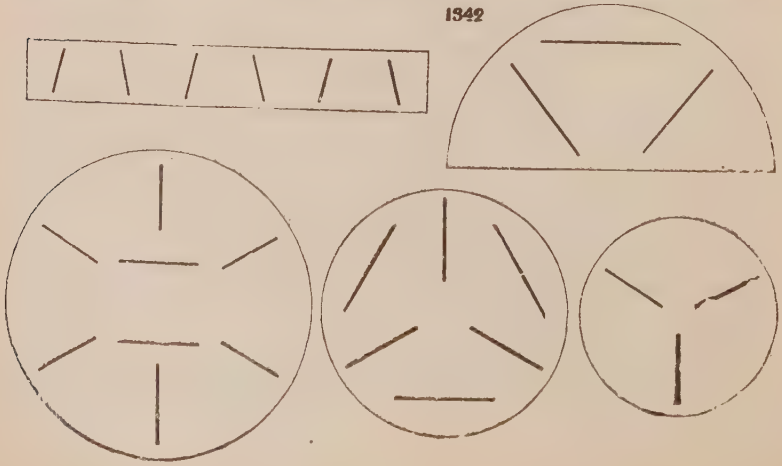

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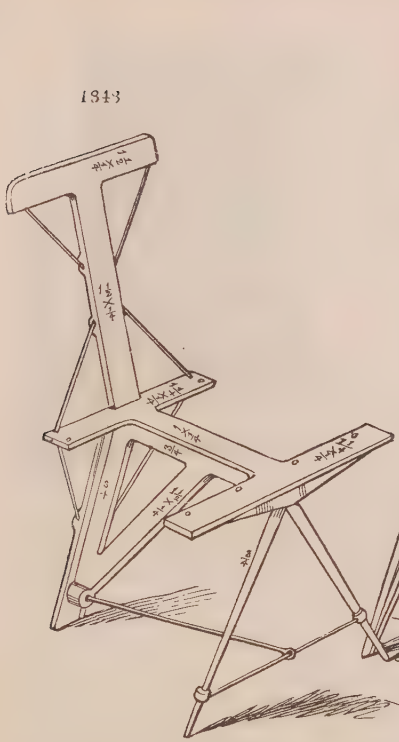

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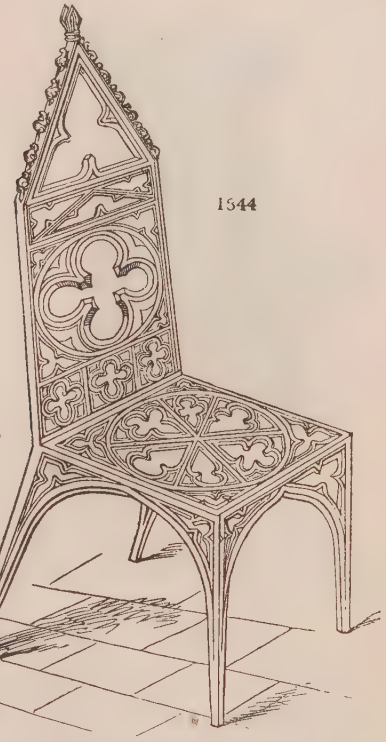

very suitable for inns. Fig. 1343 represents the frame of a chair of cast and wrought iron: the seat is not shown, but it is intended to be of wood; oak or chestnut, or an imitation of either. The whole frame of the chair is so contrived that it can be cast in one piece, with all the wrought-iron posts cast in, so as to need no subsequent fitting. The small diagonal stays are of wire, three sixteenths of an inch in diameter. The legs are of rolled gas tubing, "swagged taper," and the collars are slipped on hot, by the operation which is technically called "sinking on." This chair, which is, with the other cast-iron articles mentioned above, the invention of Mr. Mallet, weighs, when finished, no more than sixteen pounds, which does not much exceed the weight of a common parlour chair, with hair cushions. Fig. 1344 is a Gothic chair wholly of cast iron. It is cast in three pieces, which are afterwards riveted together. If roughly used, it might be liable to fracture, but it would form an excellent chair for the entrance hall of an inn, or even of a villa. Fig. 1345 is another hall chair, with an iron framework, in two pieces, and a wooden seat. This chair would do well for a luggage chair in inn bed-rooms; it being found convenient to have one strong chair with a boarded bottom in each bed-room, on which to set the trunks, &c., belonging to the guests, to prevent the lighter chairs from being injured by the weight. Fig. 1346 is a bench or settle for the veranda of a common public-house; and fig. 1347, one of a more enriched character, suitable for the hall of a country inn in the old English style. Both are taken from

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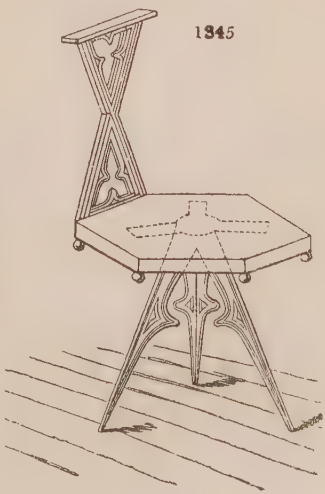

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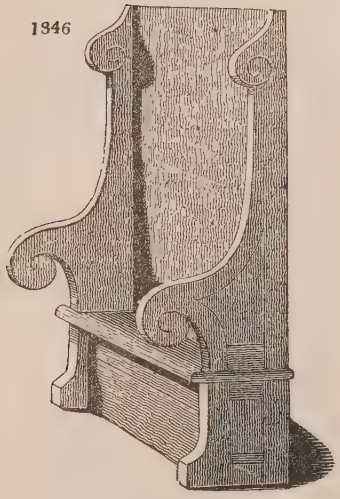

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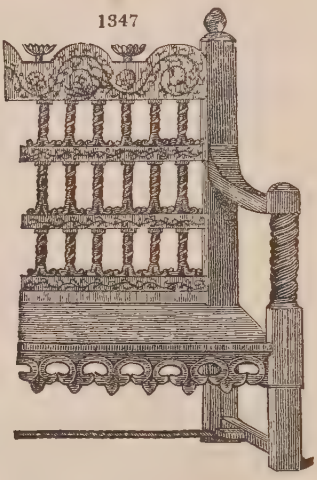

existing specimens. Fig. 1348 is a village alehouse table of a very simple but useful construction. When the flaps are down, it forms a small triangular table, as in this figure; but, as the centre board to which the flaps are hinged turns on a pivot, fig. 1349,

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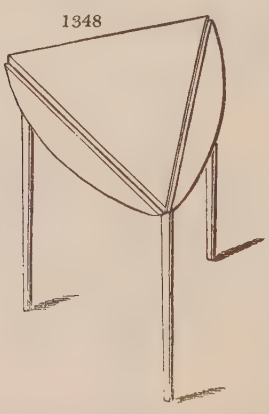

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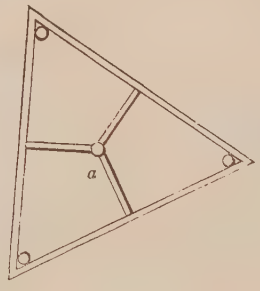

a, by lifting up the flaps, and turning the triangle half round, a table twice the size, and of a circular form, is produced, as indicated in fig. 1350. The commonest country carpenter can make this table, which is surpassed by none in cleanliness and usefulness. In general, a great deal might be saved in inns, by having the bedsteads, which at present form a main article in the expense of furnishing, of wrought iron, and the table-stands of cast iron. There are even a number of other articles which might be very properly made of this material, and painted or bronzed, which would come very cheap; for example, a towel-horse, such as fig. 1351, which in that pattern, made of mahogany, would cost 25*s.*, in cast and wrought iron may be had for 10*s.* 6*d.*; and one of a simpler description, such as fig. 1352, for 5*s.* 6*d.* In every department a saving might be made by employing this material; for example, in the simple

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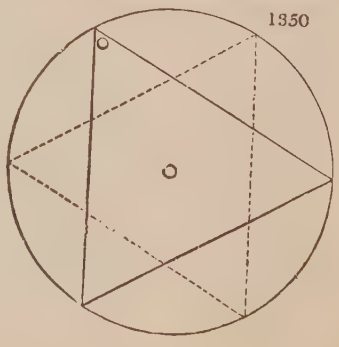

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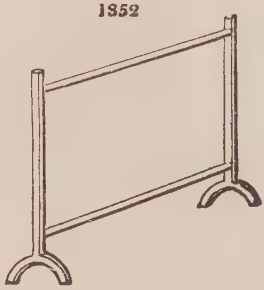

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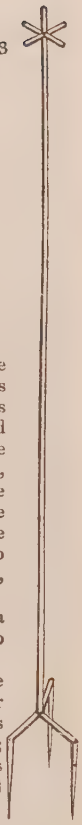


article of clothes-posts, which, when of wood, are cumbersome, and require sockets built into the ground, in which to fix them, a considerable saving is effected by having them of iron, such as fig. 1353, which costs 8*s.* 6*d.*, and is seven feet six inches high. These posts require no sockets; but, when wanted for use, may be stuck into the common ground, and removed at pleasure. We consider it unnecessary to say more on the subject of the fittings-up, fixtures, and furniture of inns and public houses; having already observed that they are essentially the same as those of cottages and villas. All large inns ought to have turret clocks, similar to those recommended for farms; and, whether they be built fireproof or not, there ought always to be a nightly watch; but as this also is practised in first-rate villas, it confirms the position with which we set out, that villas and mansions are the models for inns.

1478. *The Furniture of the Bar* consists chiefly of two or three chairs, with a common round table, a work-table, and a bureau, or writing-desk. There is also generally a clock.

1479. *For the Signs of Inns* we would recommend, as substitutes for the common daubs now generally stuck up, excellent oil paintings by superior artists, protected from the weather by projecting cornices; handsome statues of public characters placed on pedestals, or over the entrance porch or portico; or medallions of celebrated men affixed to obelisks. As the public taste in works of art improves, the present signs will go out of repute, and a better class will be substituted for them.

SUBSECT. 4. *Of the Finishing, Fittings-up, Fixtures, and Furniture of the Kitchen and Scullery of Inns and Public Houses.*

1480. *The Kitchen.* In order to prepare ourselves for treating of the fittings-up and fixtures of kitchens, we have carefully reperused what has been written on the subject by Franklin, Rumford, Sylvester, and other modern authors of less note; and we have also visited the kitchens of most of the principal club-houses, inns of court, and public inns, in London, besides those of several private houses. In 1811 and in 1826 we examined what had been done at Derby by the Messrs. Strutt; and at different times we have had an opportunity of seeing the kitchens in various parts of the Continent; and in 1829, in particular, those of some of the public establishments at Munich, erected under the superintendence of Count Rumford: we have further had an account sent us of the success of the attempts lately made in Edinburgh to boil and stew by gas, described § 1445; and have seen the very recent invention by Robert Hicks, Esq., of London, of a method of roasting by gas. To fit us for speaking on ovens, we have examined many of those of the principal bakers and confectioners in London; the new oven of the Bread Company at Pimlico; the oven and the kneading-machinery at Oxgate Farm; and have seen bread baked by steam alone, in the working-model of Mr. Hicks. The general impression made on us by all that we have read, heard, and seen, is, that very little improvement has taken place in the fitting up of kitchens, and in the construction of ovens, since the time of Count Rumford; or, perhaps, we should rather say, that a very slight approximation in practice has been made to the improvements which he pointed out, and illustrated by experiments. The inventions of Mr. Hicks, indeed, are exceptions, and may be considered as some of the most beautiful and extraordinary applications of chemical and mechanical science to the purposes of domestic economy, which have been made in this or in any other country. Two causes appear to us to have retarded the improvement of kitchens: the first is, the ignorance of cooks as to the science of the generation of heat, and the fundamental principles of cookery; and the

second, the wealth, and consequent indifference to economy, of their employers. The consequence of the first is, that a host of prejudices is raised up against every new mode of practice proposed to be introduced; and of the second, that there is an utter dislike to the trouble necessary to introduce them. Perhaps a third cause may be assigned; viz., that of the heavy rents, taxes, and other charges, to which the tradesmen who fit up kitchens, &c., are liable; and which induce them rather to favour the manufacture of articles which amount to considerable sums, and on which alone they can put such a profit as will enable them to live. There has hitherto, therefore, been no effective demand for economical improvement, nor is it likely that there will be, till it is created by necessity; or, in other words, by the diminished incomes of those who now constitute the wealthy classes. We are confirmed in this opinion by observing the economical construction of the stewing-hearths on the Continent, where the incomes of the higher classes are much lower than in this country; where the price of fuel is much higher; and where, at the same time, the cookery is of a very superior description to what is generally to be met with in Britain. We shall shortly point out the imperfections of modern British kitchens, and afterwards suggest improvements; commencing with the kitchen-range and stewing-hearths, and taking next the baking and roasting oven, the steaming apparatus, and, lastly, the art of cooking entirely by the use of gas.

1481. *In examining the Kitchen-ranges and Cooking Apparatus of the principal Club-houses and Inns of London,* we have found the construction such as to occasion the most extraordinary waste of fuel, as well as the most disagreeable labour to those employed in cooking, from the excessive heat. This results chiefly from the construction of the apparatus made use of, including its connection with the building; but partly, also, from the ignorance or indifference of the operators, in regard to the adjustment of the degree of heat to the time required for any particular kind of cookery. For example, Count Rumford has shown that meat may be boiled, or, in other words, dressed in hot water, when that fluid does not exceed 209 degrees; he has also shown that when the water is heated so as to throw off a great deal of steam, an immense quantity of heat is wasted, without the meat being better dressed than by the previous mode. He has proved that the processes both of boiling and stewing are carried on to much greater advantage, with reference to the excellence of the dishes produced, when they proceed slowly and at a low temperature, than when they are conducted rapidly and at a high temperature. In most kitchens, however, it will be found that these operations are carried on with a degree of heat far beyond what is necessary, at once to the injury of the meat, and the inconvenience of the operator. One reason, we believe, why this rapid mode of cooking is preferred by the cooks is, the excessive annoyance which they experience when long exposed to the heat reflected from the stewing-hearths and the open fires. In one of the principal inns in London, which has been lately rebuilt, and fitted up with a stewing-hearth of the newest construction, we found this hearth to consist of a plate of cast iron about six feet long and four feet broad, heated by a furnace and flue below, to a red heat. On this plate the dishes for boiling and stewing are placed, and also the gridirons for broiling. The operations are rapidly performed; but the heat of the kitchen is so intense, as to be scarcely bearable, even by the cooks; and the effect of the radiation from the red-hot cast iron on their eyes is such as to endanger their becoming blind. The reason why this cast-iron plate is adopted, rather than a stewing-hearth, with several small fireplaces, is, we are informed, that common coal may be burnt underneath it in one furnace, and thus the whole may be heated by one coal fire, instead of requiring several, in which only coke or charcoal could be burned. Even in all the more improved stewing-hearths which we have seen in the principal inns and club-houses, more than double the quantity of fuel is used that is necessary for the purposes of cooking; and all the excess of heat produced is either carried up the chimney, or thrown out so as to annoy the cook, and heat the kitchen to an intolerable degree. The most economical stewing-hearths that we have seen in London are those of the confectioners; and, next, those of the French restaurateurs and hotels.

1482. *The great Fault of British Kitchens,* Count Rumford observes, is, that the fireplaces in them are not closed. "The fuel is burnt in long open grates, called kitchen-ranges; over which the pots and kettles are suspended, or placed on stands: or fires are made with charcoal in square holes, called stoves, in a solid mass of brickwork, and connected with no flue to carry off the smoke; over which holes, stewpans or saucepans are placed on tripods, or on bars of iron, exposed on every side to the cold air of the atmosphere." In addition to the loss of heat and waste of fuel in such kitchens, the noxious exhalations from the burning charcoal, and the currents of cold air occasioned by the strong draught up the wide open chimneys, are both unpleasant and dangerous to the cooks. To complete the machinery of an ordinary British kitchen-range, which seems to be calculated for the express purpose of devouring fuel, a smoke-jack is generally placed in the chimney. No human invention, Count Rumford adds, ever came to his

knowledge, that was so absurd as this: it would not be difficult to prove, he says, "that much less than one thousandth part of the fuel that is necessary to be burned in an open chimney fireplace, in order to cause a smoke-jack to turn a loaded spit, would be sufficient to make the spit go round, were the force evolved from the combustion of the fuel, if it were properly directed, through the medium of a steam-engine." Besides this waste of fuel and of power, smoke-jacks require a large fire when it would not otherwise be wanted, by the necessity which they create for a great current of air up the chimney, to prevent it from smoking. This also increases the current of cold air from the doors and windows to the fireplace; and thus, while the side of the cook next the fire is burned, the other is chilled. A jack moved by a weight or spring, if roasting must still be performed by the barbarous practice of turning meat on a spit before an open fire, is much preferable; and the trouble of winding it up, which is the general argument against it, is much less than that of burning coals to feed the immense fire that is requisite to cause a common smoke-jack to move.

1483. *The Objects in view, in the Arrangement of a Kitchen*, Count Rumford observes, ought to be the following: —

"1st, Each boiler, kettle, and stewpan should have its separate closed fireplace.

"2dly, Each fireplace should have its grate, on which the fuel must be placed; and its separate ash-pit, which must be closed by a door well fitted to its frame, and furnished with a register for regulating the quantity of air admitted into the fireplace through the grate. It should also have its separate canal for carrying off the smoke into the chimney; which canal should be furnished with a damper or register: by means of this damper, and of the ash-pit door register, the rapidity of the combustion of the fuel in the fireplace, and consequently the rapidity of the generation of the heat, may be regulated at pleasure. The economy of fuel will depend principally on the proper management of these two registers.

"3dly, In the fireplaces for all boilers and stewpans which are more than eight or ten inches in diameter, or which are too large to be easily removed with their contents by the strength of one hand, a horizontal opening just above the level of the grate must be made, for introducing the fuel into the fireplace; which opening must be nicely closed by a fit stopper, or by a double door. In the fireplaces which are constructed for smaller stewpans this opening may be omitted, and the fuel may be introduced through the same opening into which the stewpan is fitted, by removing the stewpan occasionally a moment or two for that purpose.

"4thly, All portable boilers and stewpans, and especially such as must often be removed from their fireplaces, should be circular, and they should be suspended in their fireplaces by their circular rims; but the best form for all fixed boilers, and especially such as are very large, is that of an oblong square; and all boilers, great and small, should rather be broad and shallow than narrow and deep. A circular form is best for portable boilers, on account of the facility of fitting them to their fireplaces; and an oblong square form is best for large fixed boilers, on account of the facility of constructing and repairing the straight horizontal flues under them and round them, through which the flame and smoke by which they are heated are made to circulate. When large boilers are shallow, and when their bottoms are supported on the tops of narrow flues, the pressure or weight of their contents being supported by the walls of the flues, the metal of which the boiler is constructed may be very thin, which will not only diminish very much the first cost of the boiler, but will also greatly contribute to its durability; for the thinner the bottom of a boiler is, the less it is fatigued and injured by the action of the fire, and the longer, of course, it will last; which is a curious fact, that has hitherto been too little known, or not enough attended to, in the construction of large boilers.

"5thly, All boilers, great and small, should be furnished with covers, which covers should be constructed in such a manner, and of such materials, as to render them well adapted for confining heat. Those who have never examined the matter with attention would be astonished, on making the experiment, to find how much heat is carried off by the cold air of the atmosphere from the surface of hot liquids, when they are exposed naked to it, in boilers without covers; but in culinary processes it is not merely the loss of heat which is to be considered; a great proportion of the finer and more rich and savoury particles of the food are also carried off at the same time, and lost; which renders it an object of serious importance to apply an effectual remedy to this evil." (*Count Rumford's Essays*, essay x. p. 28.)

1484. We have given the five preceding rules in Count Rumford's own words, because they contain the fundamental principles of the construction of stewing-hearths; because no directions of equal merit have been given since his time; and because they are as requisite now as when first published, in 1799.

1485. *The Covers for Boilers* should, if possible, be made of some nonconducting substance; and wood would be the best, were it not for the changes which it is liable to

undergo from cold and heat, dryness and moisture: for this reason, Count Rumford prefers covers of thin sheets of tinned iron, made double, with a vacuity of an inch or more between.

1486. *For the Covers or Stoppers to small Fireplaces or Stewing-Hearths*, when they are not in use, fire-bricks or fire-stones are the most suitable materials; a ring or staple being let into the centre of the brick or stone, to admit of its being readily put on and taken off. By putting on a nonconducting cover or stopper, as soon as the boiler or stewpan is removed, much less heat is radiated into the kitchen during the cooling of the ignited fuel.

1487. *To prevent one Stewpan or Boiler being mistaken for another*, Count Rumford recommends having their diameters expressed in inches on their handles or brims, and also on their covers, and on the margins of the fireplaces which they fit. He also recommends the diameters of boilers and stewpans, and of the fireplaces into which they are to be fitted, to vary at the rate of two inches; and he mentions six, eight, twelve, and fourteen, as suitable gradations of size. In order that fireplaces of the same diameter might be rendered of different capacities, he recommends their being made of three different depths; viz., one third, half, and two thirds of their horizontal diameter. These different depths should also be marked on the boilers and stewpans, and on the margins of the fireplaces.

1488. *The Number and Size of the separate closed Fireplaces of a Kitchen* should be regulated by the extent of the entertainments which it is contemplated may at any time be required, and not by the average style of living. With this view, Count Rumford's recommendation, of having a separate closed fireplace for every boiler, kettle, and stewpan, is of the utmost importance; since, when very little cooking is required, not more than two or three of the separate fireplaces need be used; and, consequently, no waste of fuel is produced. In large kitchen-ranges, on the contrary, an enormous quantity of fuel is swallowed up, even when only a very small quantity of food is provided. More fuel, Count Rumford observes, "is frequently consumed in a kitchen-range to boil a tea-kettle, than, with proper management, would be sufficient to cook a good dinner for fifty men." (Essay x. p. 31.)

1489. *The Distribution of the different Fittings-up and Fixtures of a Kitchen* ought to be regulated by convenience to the cook, cleanliness in all the operations of cookery, and, as far as practicable, architectural symmetry in the general appearance. An Architect, before he arranges a kitchen, Count Rumford remarks, will do wisely to consult the cook; because it will be in vain to attempt to introduce any improvement which does not meet with the approbation of those who are to use it. He recommends an exact plan of the kitchen being taken, and the exact situation of all the doors, windows, and flues distinctly marked; as well as a list made of the number and dimensions of all the boilers, roasters, stewpans, &c., which are to be fitted up in brickwork.

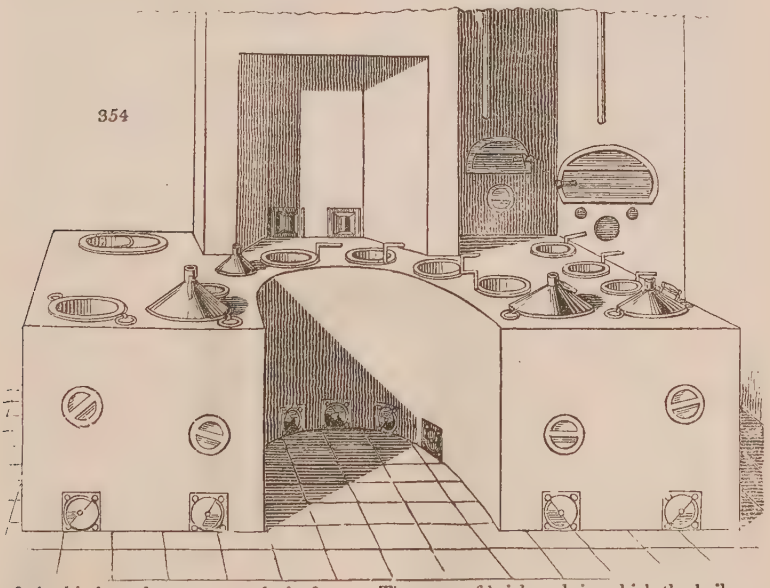
1490. *In making a Plan for fitting up a Kitchen*, the readiest way of proceeding, Count Rumford observes, is to form it on the floor of the room; and, in doing this, the work will be much facilitated by the following very simple contrivance. Cut out of thick pasteboard, detached pieces to represent the boilers, saucepans, &c., which are to be fitted up in the brickwork; and, placing these in different ways on the plan of the room, see in what manner they can best be disposed or arranged. As these models (which must be drawn to the same scale as that used in drawing the plan of the room) may be moved about at pleasure, and placed in an infinite variety of different positions in regard to each other, and to the different parts of the room; the effect of any proposed arrangement may be tried in a few moments, in a very satisfactory manner, without expense, and almost without any trouble. To facilitate still more these preliminary trials with these models of the boilers, several slips of pasteboard, equal in width to the distance at which one boiler ought to be placed from the other in the brickwork, measured on the scale of the plan, should be provided, and used in placing the models of the boilers at proper distances from each other. This distance, in fitting up or setting kitchen boilers and saucepans, may be commonly taken at the width of a brick, or four inches and a half; and may be allowed the same space (four inches and a half), for the distance of the side of the boiler from the outside or front of the mass of the brickwork in which it is set. When this point is settled (that respecting the distance which should be left between the boilers), the arranging of the pasteboard models of the boilers on the plan will be perfectly easy.

1491. *As soon as the Distribution of the various Boilers, &c., is finally settled*, a ground plan of the whole of the machinery should be traced on the plan of the room; and a sufficient number of sections and elevations should be drawn, to show the situations, forms, and dimensions of the fireplaces, and of all the other parts of the apparatus. When this is done, and when the boilers and the materials for building are provided, and every thing else that can be wanted in fitting up the kitchen is in readiness, the Architect or amateur may proceed to the laying out of the work. As this will not be found to be

difficult, and as it is really a most amusing occupation, Count Rumford earnestly recommends gentlemen, and even ladies, to superintend and direct these works.

1492. *In laying out the Work*, when a kitchen is to be fitted up, the first thing to be done is, to draw, with red or white chalk, or with a coal, a ground plan of the brickwork, of the full size, on the floor or pavement of the room. When the kitchen is neither paved nor floored, this drawing must, of course, be made on the ground. In this drawing, the ash-pits, and the passages leading to them, must be marked; and, when the ash-pit is to be sunk into the ground, that is the first thing that must be executed. As soon as this ground plan is sketched out, the ash-pit doors should all be placed, and the foundations of the brickwork laid. To assist the bricklayer, and to prevent his making mistakes, several sections of the brickwork, of the full size, and particularly sections of the boilers, represented as fixed in their fireplaces, should be drawn on wide boards, or on very large sheets of paper, or they may be drawn with charcoal or red chalk on the sides of the room. These sections, of the full size, where the bricklayer can readily take measure of the various parts of the work to be performed, will be found very useful. (*Essays, &c.*, p. 36.)

1493. *As an Example of one of the most complete Kitchens* ever fitted up by Count Rumford, we give that of the Baron de Lerchenfeld at Munich, which, though very different from most British kitchens, may yet serve as a model for the best of them, provided economy of fuel and labour, cleanliness, the beauty of fitness, and the comfort of the cook, were the leading objects of the Architect. Count Rumford observes that this kitchen has been found to answer even to the entire satisfaction of the cook, who began, however, by entering his formal protest against it. Fig. 1354 shows a perspective view



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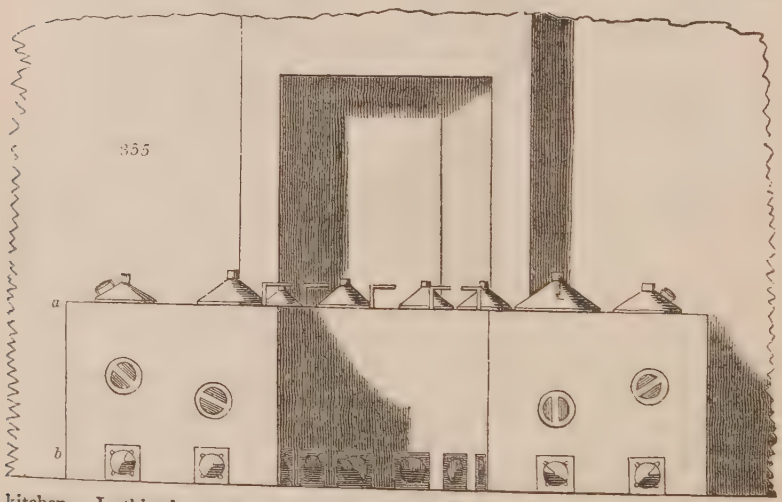
of the kitchen plan, seen nearly in front. The mass of brickwork in which the boilers and saucepans are set projects out into the room, and the smoke is carried off by flues that are concealed in this mass of brickwork, and in the thick walls of an open chimney fireplace; which, standing on it, on the further side of it where it joins to the side of the room, is built up perpendicularly to the ceiling of the room. At the height of about twelve or fifteen inches above the level of the mantel of this open chimney fireplace, the separate flues for the smoke concealed in its walls, end in the larger flue of this fireplace, which last-mentioned larger flue, sloping backwards, ends in a neighbouring chimney, which carries off the smoke, through the roof of the house, into the atmosphere. A horizontal section of this open chimney fireplace, at the level of the upper surface of the mass of brickwork on which it stands, may be seen in fig. 1358, p. 714. In this section, the vertical flues are distinctly marked which carry off the smoke from the boilers into the chimney; as also the stoppers which are occasionally taken away to remove the soot, when these flues are cleaned. These stoppers, which are made of earthenware, burnt like a brick or tile, are eight inches long, six inches wide, and three inches thick; and,

on their outsides, they have two deep grooves, that form a kind of handle for taking hold of them. When they are fixed in their places, their joinings with the doorway into which they are fitted are made tight by filling up the crevices with moist clay. The flues are cleaned by means of a strong cylindrical brush, made of hog's bristles, fixed to a long flexible handle of twisted iron wire. The open chimney fireplace was constructed in order that an open fire might be made on its hearth (which, as appears by the plan, was on a level with, or was a continuation of, the top or upper surface of the mass of brickwork in which the boilers were set), should any such fire be wanted; but the fact is, that, although this kitchen had been in daily use more than five years when Count Rumford wrote, it had not yet been found necessary to light a fire in this place. When any thing is to be fried or broiled, the cook finds it very convenient to perform these processes of cookery over the two large stoves that are placed in the front of this open fireplace; as the disagreeable vapour that rises from the frying-pan, or from the gridiron, goes off immediately by the open chimney: and these stoves serve likewise occasionally for warming heaters for ironing, and also for burning wood to obtain live embers for warming beds, or for keeping up a small fire for boiling a tea-kettle, or for warming any thing that is wanted in the family. When this fire is not wanted, the register in the ash-pit door is nearly closed; and the top of the stove is covered with a fit cover of earthenware, by which means the fire is kept alive for a great length of time, almost without any consumption of fuel; and may, at any time, be revived, and made to burn briskly in less than half a minute, merely by admitting a larger current of fresh air. Near the right hand corner of the room may be seen a front view of one large roaster, and part of the front view of a smaller one, situated by the side of it; both with their separate fireplace doors. The fireplace door of the larger roaster, as also both its blowpipes, are represented as being open; but the ash-pit door of this roaster is hid by the mass of brickwork in which the boilers are set. The convenience, in a family, of being able to have a brisk fire in the kitchen in a moment, when wanted, and to check the combustion in an instant, without extinguishing the fire, and without even cooling the fireplace, when the fire is no longer wanted, can hardly be conceived by those who have not been used to any other methods of making and keeping up kitchen fires than those commonly used in the kitchens in Great Britain.

Fig. 1355 shows a front view, or, more strictly speaking, an elevation, of the



kitchen. In this plan, the ash-pit doors, with their registers, are distinctly seen; and also the ends of the earthen stoppers, which close the openings into the fireplaces of four of the principal boilers. The covers of the principal boilers, as also of several of the stewpans, are seen above the level of the upper surface of the mass of brickwork. The height of this mass of brickwork, *a b*, measured from the floor or pavement of the kitchen, is just three feet.

Fig. 1356 shows a horizontal section of the mass of brickwork, in which the boilers, &c., are set, taken at the level of the horizontal flues that carry off the smoke from the boilers, stewpans, and saucepans into the vertical flues, which convey it into the chimney. The smoke from three of the principal boilers, situated on the left hand, is carried

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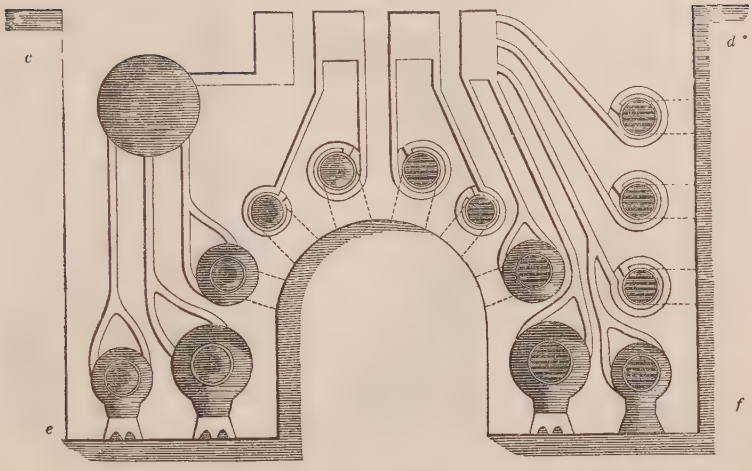

by separate flues to a circular cavity, over which a large shallow boiler is placed; in which water is heated (by this smoke) for the use of the kitchen, and more especially for washing the plates and dishes. (This boiler is distinctly seen, with its wooden cover consisting of three pieces of deal, united by two pairs of hinges, in fig. 1358.) The five fireplaces on the left hand side of the mass of brickwork are represented without their circular grates, and the eight fireplaces that are situated on the right hand are shown with their circular grates in their places. The fireplaces of the four largest boilers, which are situated in front of the brickwork, have doors or openings, closed with stoppers, for introducing fuel into these fireplaces; and three of these openings are represented in the plan as being closed by their stoppers; while the fourth (that situated on the right hand) is shown open, or without its stopper. As all the rest of the fireplaces (or stoves, as they are commonly called in this country) are without any lateral opening for introducing the fuel, when any fuel is to be introduced into one of these fireplaces, the stewpan or saucepan covering it must be removed for a moment for that purpose.

1494. *Several of the horizontal Flues* that carry off the smoke from the boilers are divided into two branches, which unite at a little distance from their fireplaces. This contrivance is very useful, especially for closed fireplaces that are without flues under the boilers, as it occasions the flame to divide under the bottom of the boiler, and to play over every part of it in a thin sheet. Dampers to the flues are omitted in these diagrams, in order to avoid confusion, but they must on no account be left out in practice; for they are of such importance that there is no possibility of managing fires properly without them. It is of very little importance whether they be placed near the fire or far from it, or what is their form, provided they be so constructed as to diminish at pleasure, and occasionally to close entirely, the flue by which the smoke makes its escape.

1495. *The dotted lines* leading from the front of the brickwork to the fireplaces show the position and dimensions of the ash-pits. The whole length of the mass of brickwork from *c* to *d* is eleven feet, and its width from *c* to *e* is seven feet four inches. The space it occupies on the ground may be conceived to consist of six equal squares of forty-four inches each, placed in two rows of three squares each; these two rows being joined to each other by their sides, and forming together a parallelogram. In laying out the work, when a kitchen is to be fitted up on the plan here described, it will always be best to begin by actually drawing these six squares on the floor of the kitchen. Nearly the whole of the middle square of the back row is occupied by the open chimney fireplace, and by its thick hollow walls; and the greater part of the middle square of the front row is left as a passage for the cook to come to the open chimney fireplace, or rather to the stoves that are situated near it.

Fig. 1357 represents a vertical section of the mass of brickwork through the centres of the fireplaces of the four principal boilers; and is chiefly designed to show the construction of those fireplaces, and also that of the boilers. Sections of the circular grates, on which the fires are made to burn under the boilers, are here represented; and

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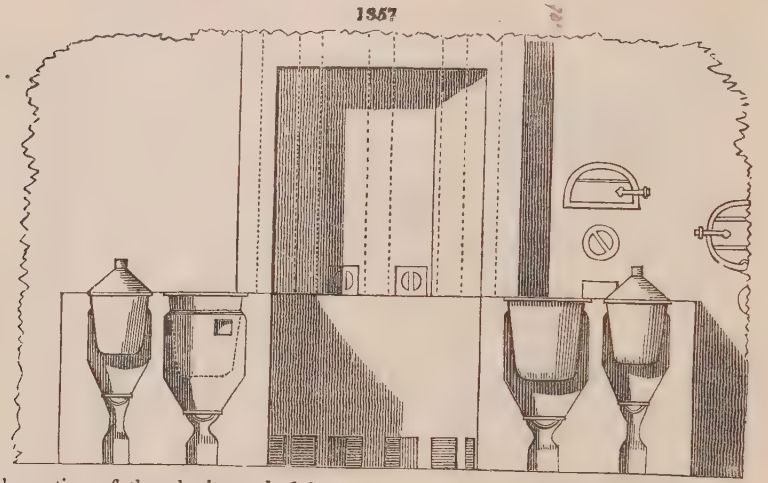

also sections of the ash-pits, and of the contractions of the fireplaces immediately below the grates; and in one of the fireplaces, which is shown without its boiler, the openings of the branched flue by which the smoke goes off horizontally towards the chimney are also marked.

Fig. 1358 shows a birds-eye view of the upper surface of the brickwork, with all the

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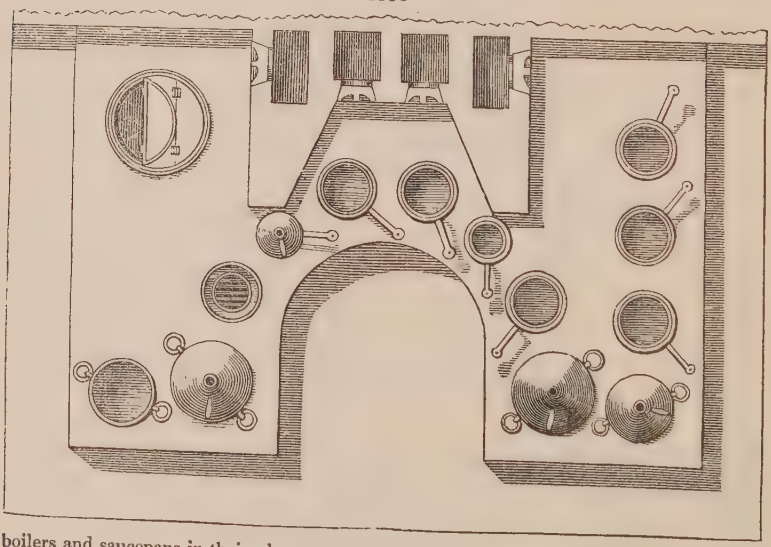

boilers and saucepans in their places, except one; three of the principal boilers and one saucepan, with their covers on; and the rest of them without their covers. It likewise represents a horizontal section of the open chimney fireplace, four inches above the level of the top of the mass of brickwork, in which the boilers and saucepans are set. It is to be observed, that all the boilers, stewpans, and saucepans are fitted into circular rings of iron, which are firmly fixed to the brickwork; and that they are suspended in their fireplaces by these circular rims. All the stewpans and saucepans that are not too large to be lifted, with their contents, in and out of their fireplaces by the strength of one hand, have iron handles attached to their circular rims; but the four principal boilers, which are too large to be managed with one hand, have each two rings fitted to their

rims. These handles and rings are so constructed that they do not prevent the saucepans and boilers from fitting the circular openings of their fireplaces; neither do they prevent their being fitted by their own circular covers.

1496. *Deep Boilers economise Space in a Kitchen;* and when their fireplaces are properly constructed, and, above all, when they are furnished with good registers and dampers, the additional quantity of fuel they will require more than what is necessary for shallow boilers, will be too trifling to be considered. The walls of their fireplaces will absorb more heat in the beginning, but the greater part of this heat may afterwards be emitted in rays, and at last find its way into the boiler.

1497. *A Kitchen of this Construction* is warmed in cold weather by the mass of brickwork forming the stewing-hearth, which is made sufficiently hot by the fires that are kept up in it when cooking is going on every day, to keep the room comfortably warm in the coldest weather. It is prevented from being too warm in summer by opening one of the windows a very little; and by opening, at the same time, the register of a wooden tube or steam chimney, which, rising from the ceiling of the room, ends in the open air, and which is always opened to clear the room of vapour when it is found necessary, and especially when the victuals are taken out of the boilers; or when any other operation is going on that occasions the diffusion of a considerable quantity of steam.

1498. *The Dimensions of the Boilers in this Kitchen* are as follow:—

	Wide at brim. Inches.	Deep. Inches.
One large boiler for hot water heated by smoke	20	8
Two large boilers	16	16
Two ditto, used occasionally in the fireplaces of the two boilers last mentioned	16	8
Two smaller boilers	12	12
Two ditto fitted to the same fireplaces	12	6

The diameters of the stewpans and saucepans are twelve, ten, and eight inches, and their depth is made equal to half their diameters.

1499. *The Fuel burnt* in this kitchen is wood; and the billets used are cut into lengths of about six inches. In Britain, coke, or even coal, may be used; but coke is preferable.

1500. *In the Construction of these Fireplaces,* common bricks were used; but care was taken to lay them in mortar composed of clay and brickdust, without any sand, and with only a very small proportion of lime. (*Essays, &c.*, p. 50.)

1501. *As an Example of the present Mode of fitting up Stewing-Hearths in Britain,* we may refer to fig. 1359, engraved from a sketch, which has been furnished us by

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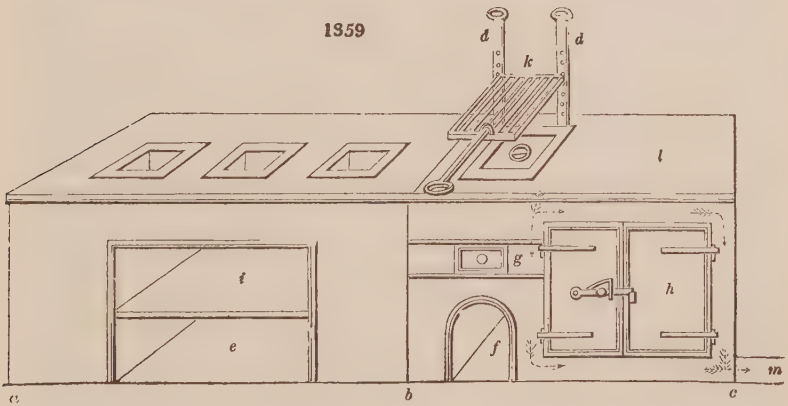

Mr. W. Jeakes of Great Russell Street, London. This gentleman has fitted up the whole of the extensive cooking apparatus in the kitchens of the principal club-houses in the metropolis; of which that of the Travellers' Club, and that of the United Service Club, are the best. The Design before us, which, as compared with those of the club-houses, may be considered to be on a small scale, consists of two parts. The first part from *a* to *b* is a range of three charcoal or stewing stoves, the front of which is made of cast iron, with an opening, having an iron shelf dividing the space into two parts, upon one of which, *i*, fall the ashes of the consumed charcoal. The space, *e*, underneath the shelf, is

intended to contain a store of charcoal for immediate use. The body of the mass within the iron front is composed of common brickwork, and paved, or covered at top with paving tiles, cut so as to fill the exact space. The stoves are made of cast iron, about four inches deep, and from six to twelve inches square, with bottom gratings also of cast iron. The second part, extending from *b* to *c*, is a boiling-stove, with an oven attached, heated by the same fire. It is considered one of the most useful and convenient apparatus that have yet been invented, and one which, Mr. Jeakes says, no kitchen should be without. There is no branch of cookery, he adds, that cannot be effected by it, except roasting, which, he is of opinion, ought always to be done before an open fire. From the peculiar construction of this hearth, fuel of any kind may be burnt in it, without the least smoke or effluvia. From *b* to *c* is an iron front, with an opening at *f* for receiving a store of fuel, of which the most suitable kind is coke mixed with a little coal; *h* is a square iron oven with double doors, and movable grated shelves, in which may be baked either meat or pastry; *g* is a sliding door by which the ashes are removed that fall from the broiling-stove. The top of the stove is made of cast iron, about one inch and a quarter thick, with three movable plates fitting into each other, and forming a close cover over the fire. The pan or stove on which the fire is placed, is in the form of fig. 1360, and is made of cast iron, with a loose bottom grate, which may be renewed when required, without taking down any part of the framework. This stove is fixed immediately under the movable plates, or ovens, shown as if in one piece under the gridiron, *k*. When stewing or boiling is to be performed instead of broiling, one or more of these plates is to be removed, according to the size of the boiler or stewpan; and the whole may be taken away when the open fire is required for the gridiron. The flue from this fire is so arranged, that the smoke and flame pass under the top plate, *l*, and over and down the sides of the oven in the direction of the dotted arrows, and enter the chimney at *m*. In this chimney a damper must be fixed, in the most convenient situation, to regulate the draught. The iron plate *l* is fitted with a pair of movable standards, *d d*, by means of which, a gridiron made for the purpose is suspended immediately over the fire, and may be adjusted to any height, from the standards being furnished with a number of holes for the purpose of receiving the prolonged ends of the side styles of the gridiron. When it is desired to broil over the fire, it is usual to remove the two inner covers or plates, and to shut the sliding door, *g*. When the plate *l* is required to be heated throughout, the sliding door, *g*, must also be closed. Judging of this plan by the principles and models laid down by Count Rumford, we should say that it errs in having so large a surface of cast iron for the radiation of heat into the kitchen; and, also, in having the fireplaces square, instead of circular, and formed for burning charcoal, instead of having flues for burning coke or coal. These may be called sins of commission; those of omission are, the want of deep round furnaces, by which small boilers may be let into the brickwork, in the manner shown in the plan of the Munich kitchen, § 1493, fig. 1356; the want of a reflector over the gridiron; and the want of a means of ventilating the oven, so as to render it a substitute for an open fire for roasting meat. The reflector, or dome, for the gridiron, may be made in the form of a cone, of either iron or copper; and its use is to prevent the meat, while broiling, from cooling above, while it is being cooked below. The ready answer of all ironmongers to such objections is, that brickwork is soon loosened and deranged by servants, and that economy of fuel in the kitchen is seldom an object with great families. As to a smoke-jack, the London ironmongers, so far from agreeing with Count Rumford that it is a source of the greatest waste of fuel, affirm that it creates a draught in the chimney; which is about as correct as if it were asserted that a boat carried down a stream were the cause of that stream; or a windmill the cause of wind. After all, this is only the operation of cause and effect; and the adjustment of means to ends; for, if there is not a demand for a maximum of effect with a minimum of expense, what use would there be in producing it? It is sufficient for every tradesman to accommodate himself to his customers. Such is the language which we are obliged to hold, in a country where it requires the utmost exertions of health, intelligence, and industry, to exist.

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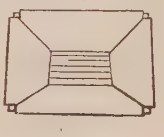

1502. *The Cooking-Hearths of Confectioners in London* are among the most economical which we have examined. In these there is one vertical flue, into which all the horizontal flues from the different furnaces are conducted. These furnaces are circular, and they are sunk, like those of Count Rumford, in a hearth of brickwork; each furnace consisting of a cast-iron pot, in shape exactly like a common flower-pot, with a grated bottom, and covers of three different sizes. The pot and the bottom are cast in one piece; and the sides are, in general, nearly one inch in thickness. Within a short distance of the top, in some instances two inches, in others four, according to the depth of the saucepan which is to be inserted in them, are two lateral openings, about three

inches long by one inch deep, for conveying away the smoke, in two horizontal tunnels or flues, to the vertical chimney which forms a common flue to the whole. Under each furnace there is a separate horizontal tunnel for the admission of air to supply combustion; and this tunnel is furnished with a register in front of the hearth, or, sometimes, with a block or stopper of fire-brick or fire-stone fitted to the opening; which stopper, by being inserted partially or wholly, regulates the admission of air. With four such furnaces, of six, eight, ten, and twelve inches in diameter, a very extensive confectionery business may be carried on; and it must be recollected that the business of a confectioner in London includes the cooking of dinners and suppers for large parties, with the exception, in general, of roasting joints of meat. When the cast-iron pots wear out (which they do, even if the sides are an inch in thickness, in two or three years, where there is a full business), they are taken out and replaced by new ones. It will be observed that, in this arrangement of a cooking-hearth, there is no exterior surface of cast iron; and, in consequence, very little heat is radiated into the kitchen: indeed, we have been in some confectioners' kitchens when the cooking of a large supper was going forward, and found the temperature not exceeding that of a common room. If we were asked how we would fit up a kitchen either in an inn, or in a private house, so as to perform every description of cookery, French, German, Italian, and English, in the most perfect and in the most economical manner, we should say, take your hints for a stewing-hearth from the hearths of confectioners; and, for roasting, construct one of Strutt's roasters, or an improved baker's oven. We shall hereafter show that, for a country inn, by far the cheapest mode of roasting meat is in a baker's oven; and that, however contrary may be the common opinion, when the meat and the oven are both properly attended to, the former is, in all respects, as good as that roasted before an open fire.

1503. *An Oven for Roasting Meat*, so as to make it equal in flavour to that roasted before an open fire, was, we believe, first brought into notice in this country by Count Rumford; though this mode of roasting had been long before practised by the French. The art of roasting in an oven meat, which shall have the same flavour as that roasted before an open fire, consists simply in producing a continual current of hot air around it. How this is to be done in an oven of sheet iron, heated by a furnace below, has been shown by Count Rumford, in the Second Part of his Tenth Essay, published in 1799; but the same thing was invented by, and used in, the family of William Strutt, Esq., of Derby, in 1797. Mr. Strutt's roaster has been used in his own family, and in the families of his relations and some of his friends, from that time to the present, for roasting meat of every description, and for general baking. We examined, in 1810, a roasting-oven, and very complete arrangements for cooking in ovens and closed vessels, without any other open fire than a very small one, which had been just erected in the house of Mr. Joseph Strutt, at Derby, on Mr. William Strutt's principles; and, in common with most strangers who visit that town, we have seen the roaster in the Derbyshire General Infirmary. We have also seen one in Mr. Sylvester's house in Great Russell Street, and others at several ironmongers' in London, where they have been set up, by way of experiment. Among these, we may particularly refer to Mr. Stephens, ironmonger, in Great Russell Street, who has long been in the habit of fitting up kitchens with all the improvements introduced by Mr. Strutt, and recommended by the late Mr. Sylvester, at one time a partner in the house, and by his son, the present eminent domestic engineer. The construction of Mr. Strutt's roaster, and also of that of Count Rumford, is such, that an equal degree of heat is communicated to the bottom and to the four sides; and that a current of heated air is constantly passing through it. Roasting-ovens of iron, however, belong more to ironmongery than to Architecture, and therefore we shall not enter into details. Count Rumford's will be found minutely described in the Second Part of his Tenth Essay; and that of Mr. Strutt in Sylvester's *Philosophy of Domestic Economy*, p. 33. The principle common to both is, first, the placing of an oven, or box, within a box, and the circulation of the heat from the fire equally, in every part of the vacuity between the two boxes; and, secondly, the introduction of a tube between the two boxes, which shall heat a current of the external air, and introduce it into the inner box at or near the bottom, on the one side; with another tube, having its orifice near the bottom of the opposite side, to carry it off. This tube, as well as the fire flue, has a register for regulating the current of heat; so that the proper temperature and current of air can, at all times, be maintained in the oven.

1504. *The Union of Roasting and Baking Ovens with Kitchen Ranges* has been attempted, and with considerable success, by a great number of ironmongers, since the publication of Count Rumford's Essays. The first effort consisted in piercing one opening in the cast-iron door of the oven, near its bottom, for the introduction of fresh air, and another near its top, for the exit of air, in order to occasion circulation within. But this was found to chill the meat, and prevent its being sufficiently roasted. These ovens had no double sides, bottoms, or tops; and, without very careful management, meat

could not be properly roasted in them. The fire was generally introduced underneath the oven, either from the open fireplace on one side, or from a small separate furnace beneath; but this arrangement was found to overheat the oven in one place, and, consequently, to burn on one side whatever was roasted or baked in it. This defect led to the adoption of double bottoms and double sides next the open fireplace; and, in some cases, to the introduction of the heating flue over the oven, or at the back of it, instead of under it. Ultimately, an approximation was made, by double sides, bottoms, and tops, to the ovens of Mr. Strutt and Count Rumford. We shall here describe one of these, frequently used in connection with the open fire of the kitchen range; protesting, however, against the open fire, as much too large, and repeating our opinion, that it ought to be altogether dispensed with in every kitchen whatever, on a large scale. The Designs for this roasting-oven were furnished to us by Mr. Jeakes before-mentioned.

Fig. 1361 shows the inside of the oven or roaster, with the bottom removed; in which *a a* are openings for the admission of air, which circulates through the double bottom to the back of the oven at *b*, the two streams joining in one at *c*, and returning to the front of the oven at *d*; *e e* are grooves for two shelves, which ought always to be of open work, in order not to impede the circulation of air.

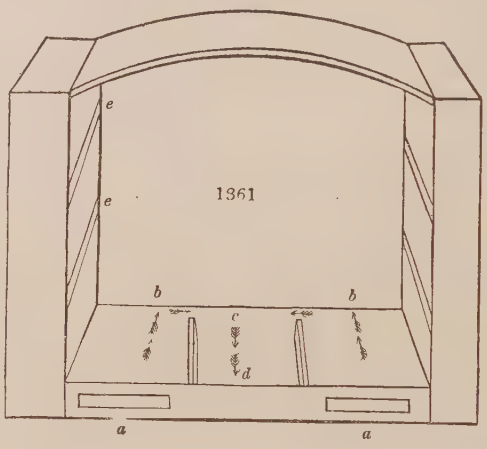

Fig. 1362 shows the inside of the roaster with the bottom put on; in which *a a* represents the holes for the admission of air to be heated, and *d* the opening for the ascent of the air when heated, in order that it may circulate in the roaster.

Fig. 1363 is a front view of the oven with the door put on, but with the front casing and top of the flue round it removed. The smoke enters from the open range at *f*, and proceeds to *g* and *h*, where there is a partition, *i*, which forces the smoke to come from the back to the front, before it ascends the upright flue, *k*; *l* and *m* are the bottom and two top bars of the range, which are riveted into the style, *n*; the intermediate bars, being subjected to greater heat, are let in loose into the style, to allow of their contraction and expansion. The openings, *a a*, in this figure, are shown with projecting caps, to prevent dust from getting into them; which caps may be prolonged downwards, so as to act as a sort of blower.

1362

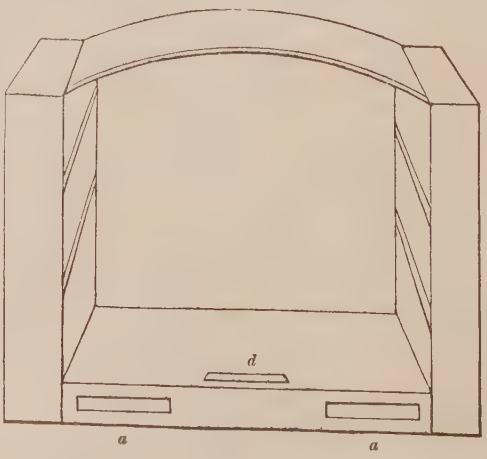

Fig. 1364 is a transverse view of the roaster, with the outer casing removed. in which are shown the end of the latch of the door of the oven, *o*; the direction of the smoke up the side, and under the top of the roaster, *p*; the upright flue, *q*; and a cast-iron tube, *r*, at the back of the top of the roaster, the lower end of which projects down to within six inches of the bottom, for the purpose of carrying off the air which has been circulated

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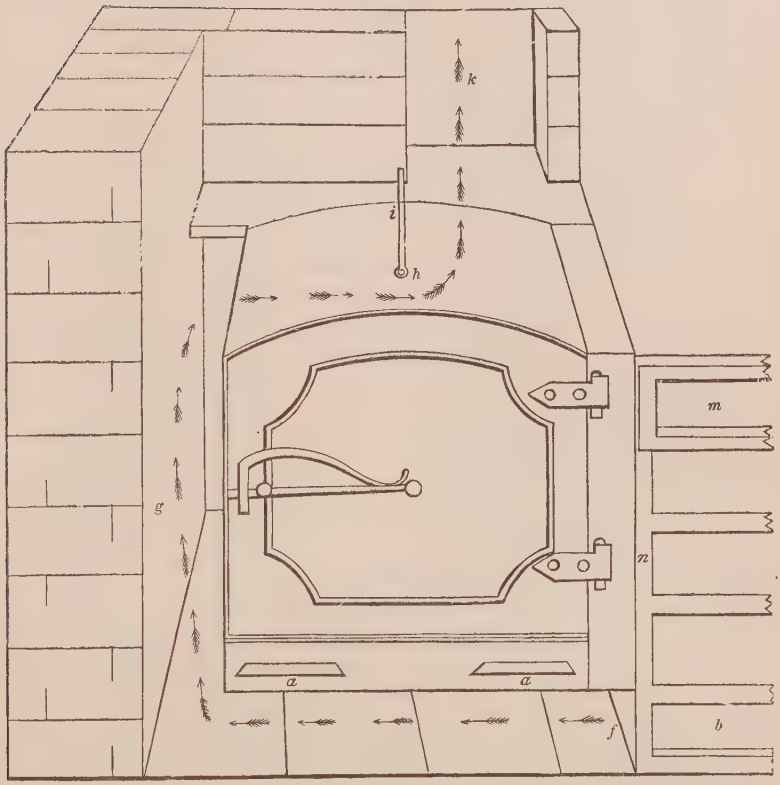
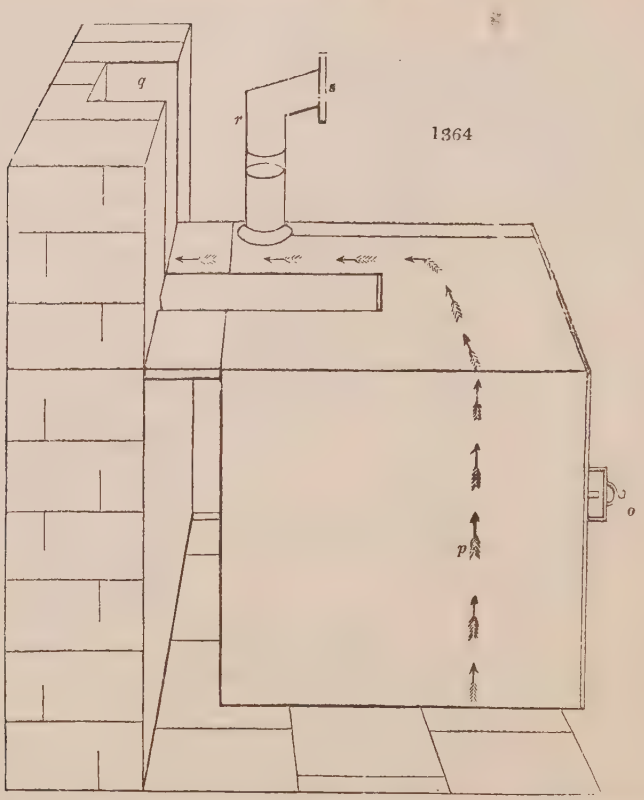


among the articles cooking; and the upper end may be carried as high as the chimney bar or lintel will admit. This tube terminates in a register at *s*, by which the circulation of air in the oven is accelerated or diminished. We have introduced this kitchen range roaster to show Architects who have not made themselves acquainted with the subject of roasting in ovens, what sort of kitchen ranges they ought to recommend. For want of this knowledge, we continually see inns fitted up with ranges and large ovens, entirely without a system of ventilation by heated air, and which, therefore, are comparatively useless, or at all events unprofitable, to their owners. Such is the ignorance of the public, and impudence of some ironmongers, on this subject, that, in the first week of the present year (1833), a large furnishing ironmonger in Holborn advertised what he called the "best kitchen range in London" for country inns, &c. On calling to see this range, we found it nothing more than a common one of a large size, with a brass register in the oven door for admitting cold air direct to the articles baking, but with no system of ventilation. The seller, as a recommendation, declared it to be constructed on Count Rumford's principles, with all the latest improvements.

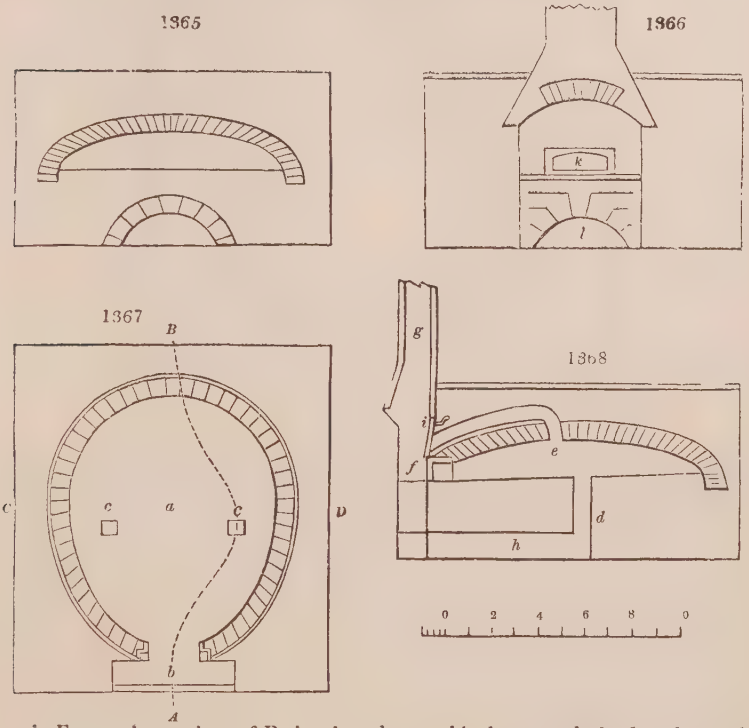
1505. *An Oven for baking Bread* is essential to every country inn; and in the same oven it will generally be found that meat can be roasted, in large quantities, more economically than by any other means. We shall first describe a rude kind of oven adapted for new countries, where it is frequently necessary to use for fuel green boughs; and next give a plan of the most improved description of oven for baking bread and roasting meat, calculated for being heated by dried billet wood, peat, or coal. The ordinary size of bakers' ovens is from eight to twelve feet square; those of confectioners are smaller, and frequently higher, with portable shelves of iron. The height of a baker's oven is about eighteen inches in the centre, in ovens of the smallest size, and two feet in those which are larger. The lower and flatter the arch is, the more easily is the oven heated, and the more equally does it give out its heat. The sides of the oven need never



be higher than a foot; that height giving sufficient room for a large loaf, and there can be no reason why the roof of the oven should be higher in the centre than at the sides, except that it is impossible to build the soffit of an arch perfectly flat. The floor of the oven is laid with tiles, and the arch is formed of fire-brick, fire-stone, or trap, set in fire-clay, or in loam mixed with powdered brick. The whole is surrounded by a large mass of common brickwork, to retain the heat. A variety of details on the subject of ovens will be found in White's *Treatise on the Art of Baking* (chap. iii. p. 158); a book which will repay perusal, if only for the quaintness of its style, and the variety of extraneous matter which it contains.

1506. *Oven for Green Wood.* Fig. 1367 is a ground plan of a common country oven, in which *a* is the floor of the oven; *b*, the sill of the door; and *c c*, holes in the floor, communicating with a tunnel below, for the purpose of admitting air to urge combustion, when green wood is burned. Fig. 1368 is a longitudinal section on the line A B, in which *d* is one of the openings for the introduction of fresh air to the green fuel, but which is closed by a fire-brick, or by building up the entrance to the funnel, *b*, when dry fuel is used; *e* is a flue from the highest part of the arch of the oven, for conveying away the smoke to the chimney, *g*, when green fuel is used, but which is closed by a stopper at *i*, when the oven is heated by dry fuel; *f* is the door to the oven, and *g* the chimney. When dry fuel is used, the orifices at *d* and *i* are closed, and the fuel, being introduced at *f*, is ignited there, and pushed forward to the centre of the oven, where it burns till consumed, or till the oven is sufficiently heated; the smoke passing out by the upper part of *f*, and ascending the chimney, *g*. When sufficient heat has been obtained, which is between 250° and 300°, and which the baker knows by experience, never using a thermometer, the floor of the oven is cleaned out, and the bread introduced; the door, *f*, and the stopper, *i*, are then closed for a short period; after which a very small opening is made, by loosening the stopper, *i*, to admit the escape of the vapour exhaled from the bread. This vapour, or whatever proceeds from the door, *f*, when it is opened either to examine or to take out the bread, ascends by the open chimney, *g*. Fig. 1365 is a trans-

verse section on the line C D; and fig. 1366 is a front elevation, showing the door to the oven, *k*, and the opening to the tunnel below, *l*. Ovens of this description are in general



use in France; but in those of Paris, where dry wood is always used, the funnels, *d* and *e*, are seldom made use of, but to cool the oven, or to admit of the escape of the vapour from the bread. It may be observed, also, that, in some of the ovens of Paris, the fuel, instead of being burned on the general surface of the hearth, is consumed in iron gratings or baskets, placed over the openings, *c c*; which is found a more rapid and economical mode of heating, than that of making a fire on the floor of the oven.

1507. *Oven for Coal.* Ovens like that just described, but most frequently without the funnel, *e i*, in fig. 1368, were almost the only kind used in Britain, till about fifty years ago, when an improvement was made in them, in order to admit of heating them with coal, by Powell, an oven-builder in Lisle Street, London. A subsequent improvement has since been made by Waugh, of Howland Mews, Tottenham Court Road, which consists in the introduction of a register or damper for the oven flue. That this damper should not have been introduced sooner is a proof that very few have looked at the oven with a scientific eye. We have examined a great number in London, and found most of them of a very rude construction; but, rude as this construction is, we have found no one acquainted with it, but a particular description of bricklayers, whose exclusive business is that of building ovens. The process of heating an oven by coal is rather interesting to those who have never seen an oven heated otherwise than by wood. After lighting the fire, the roof of the oven in a short time is perfectly black with soot; some time afterwards, in consequence of the intensity of the fire, the soot begins to ignite, and eventually becomes red; in this state it remains only a few minutes for the intensity of the fire being continued, it turns white, and drops, like a shower of volcanic ashes, on the floor of the oven. The oven is now considered to be sufficiently heated; the furnace door is thrown open, and the floor of the oven wiped out, so as to be ready to receive the bread. We shall shortly describe the best sort of baker's oven now in use in London for baking bread and roasting meat; suggesting certain additions to it, calculated for performing the latter operation in a higher degree of perfection.

Fig. 1369 is a ground plan of an oven, rather under the middle size; in which *a* is the furnace, for heating it by coal or wood, as may be most convenient; *b* is the door of

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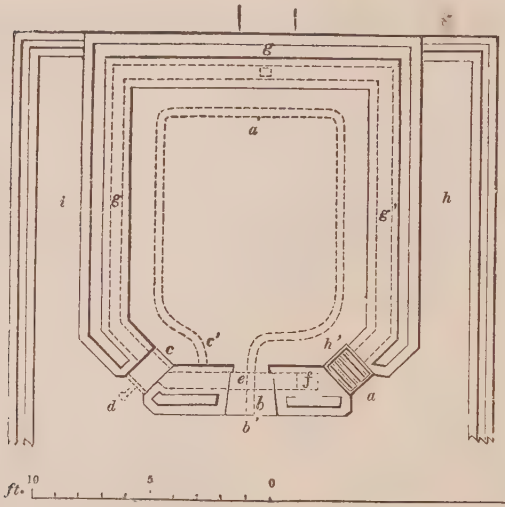

the oven; and *c*, the opening to a smoke flue which is regulated by the damper, *d*. This flue passes over the oven door by *e* to *f*, where it ascends a vertical flue, in order to escape into the atmosphere. Directly over *e* is a valve or register, which opens into the flue over it, and which is found extremely useful when the baker opens the oven to draw the bread; as it admits of the ascent of the steam and vapour, which would otherwise prove a great annoyance to the man, besides overheating the bakehouse. This register or valve is a plate so nicely balanced by two pivots, that it is opened and shut with the greatest ease; *g* is a vacuity round the mass of brickwork, for the sake of retaining heat. On the furnace side of the oven is shown a place for fuel, *h*; and on the other side, *i*, may be kept certain pieces of quartering, which are put in the oven between the bread and its sides; here also may be kept the peels, or long-handed shovels, used in drawing the bread, and other oven implements.

Fig. 1370 is a longitudinal section, in which is shown the door of the oven, with the register over it open at *j*; the smoke-flue above, *k*; the entrance to the smoke-flue, *l*; and a small oven, or proving place, *m*, in which certain descriptions of bread are put, to undergo a heat of from seventy to eighty degrees, to prove or raise the dough before it is put into the principal oven. This heat is communicated through the bottom of the oven above, and is retained by keeping the door always shut, except when articles are to be put in or taken out. There is another oven, *n*, of the same description, over the central oven, for proving at a temperature of eighty degrees. In order to save the whole of the heat generated by the oven, except what is radiated from the front of it, which we suppose to be barely sufficient in winter to keep the bakehouse at a proper temperature, we have shown it covered with a poultry-house, *o*, fitted up with nests, in the

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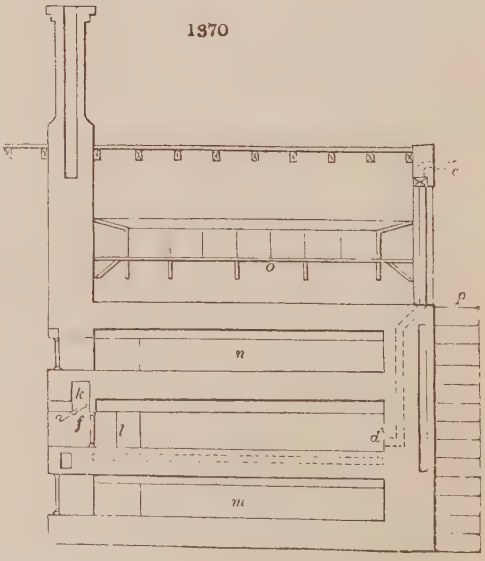
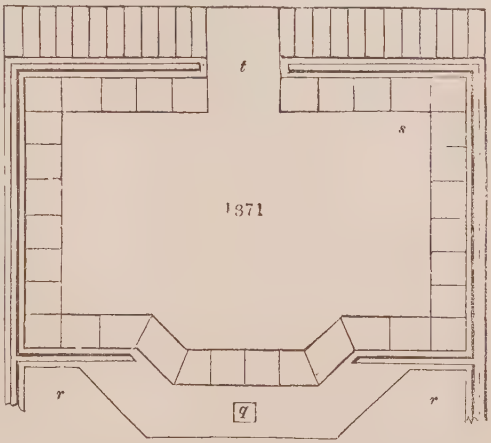


manner already described, § 1326; *p* is the stair or ladder, by which this poultry-house is entered. Fig. 1371 shows its ground plan; in which *q* is the flue of the oven; *r*, the bakehouse; *s*, the nests; and *t*, the stair and door. It is almost needless to observe that the poultry-house may be omitted when not wanted.

Fig. 1372 is a section across the bakehouse, showing the front view of the oven; in which *u* is the door of the furnace, over which is placed a square copper for heating water, which is drawn off, as wanted, for mixing with the flour, by the siphon and cock, *v*; *w* is the pipe which supplies the water; *x* is the register to the smoke flue, from which the smoke proceeds to the chimney top, as shown by the dotted arrows; *y* is the place for bakehouse implements; *z* the compartment for fuel; and *&*, the door of the principal oven, over which may be seen the door of the upper proving-oven, and under it that of the lower proving-oven.



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1508. *To fit a Baker's Oven, such as this, for roasting Meat,* which shall in all respects be equal in flavour to meat dressed in the roasters of Mr. Strutt or Count Rumford, or

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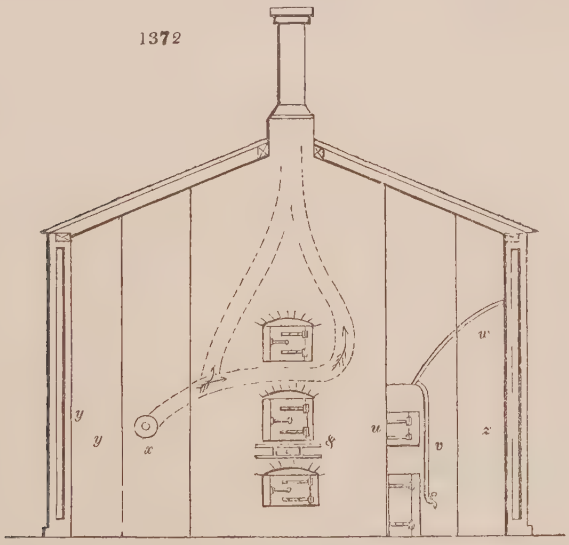

before an open fire, only a very slight addition to the plan is necessary. Let a small flue, fig. 1369, *á*, be formed under the tiled floor of the oven, commencing under the shelf of the door at *b'*, and continued round by *a'* to *c'*, where it may ascend the side wall a few inches, and then open into the oven. This will suffice for the purpose of introducing a stream of heated air; and after this air has circulated in the oven, it may be carried off by another flue, of the same dimensions, in the back wall, commencing a few inches above the floor, as shown at *d'*, in fig. 1370. This flue may be carried up to the vacuity in the wall of the poultry-house; and the air, after circulating there, may be allowed to escape by the highest point, *e'*. In fig. 1372, at *f'*, may be seen a sliding register for closing the orifice to this flue, when baking alone is to be performed; and for opening it, or regulating the opening, when roasting is going forward. Another improvement might be made in an oven of this description, which would be

that of having a smoke-flue around it, commencing at the furnace, *a*, and ending at the damper, *d c*, as indicated by the dotted lines, *g'*. The use of this flue is to admit of throwing heat into the oven at pleasure, while roasting is going forward; and this might easily be done, by having a register at *h*, to the furnace *a*, which would render a second furnace unnecessary. A little alteration would be required in the construction of this furnace, so as to admit of fixing the register; and working it on the outside with ease: but whoever has ingenuity enough to execute such a plan will readily anticipate this and other minutiæ. It may be observed, that there is a description of register now in use in coal ovens, which would answer for this purpose quite well, in default of a better. It is simply a cast-iron plate, with a foot or bottom, by which it is kept upright. This plate, which stands inside the oven, is shut from the inside, close against the mouth of the furnace, when it is desired to prevent the introduction of heat, the outer door being opened; or it is placed obliquely against the inner opening of the furnace with the outer door closed, to guide the flame and smoke in particular directions.

1509. *Mr. Hicks's Oven* is a great improvement on those in common use; but, as it is more adapted for towns, and for baking on a very large scale, than for country inns, we deem it sufficient to refer to the engraving and description of it in the *Mechanics' Magazine*, vol. xiv. p. 417. We have seen this oven at work in the magnificent baking establishment at Pimlico; and also witnessed bread baked in a small model of it in Mr. Hicks's drawing-room, in Wimpole Street. The main object of Mr. Hicks's improvement is, to collect the alcoholic vapours, which are given out by every fermenting substance; and this Mr. Hicks's apparatus effects most completely. The spirit comes over along with a large proportion of water, perhaps equal to three fourths of the weight of the dough when put in, and is afterwards separated by distillation. Count Rumford found that rye bread, which is but very slightly fermented, lost an eighth part of its weight in baking. There can be no doubt that the spirit might be as effectually collected and condensed, in the small ovens of private families, as in the large ovens of public establishments; but the excise laws of this country are too troublesome to render this worth while: and in other countries, where spirits are cheap, the expense of the machinery would be an objection.

1510. *Baking by high-pressure Steam.* Mr. Hicks has subsequently invented an apparatus for baking by high-pressure steam, which may justly be considered as a very superior mode to the process of direct fire heat. The dough is not only baked, but is previously divided by the apparatus into equal-sized loaves. We have seen full-sized loaves baked in Mr. Hicks's working-model, and have no doubt of the excellence of the plan for public companies; but we are not so certain of its suitableness for inns or private families, from the largeness of the first cost, and from the intricacy of the machinery.

1511. *Baking by hot Water.* An oven to be heated by hot water circulated in hermetically sealed tubes, and consequently capable of being heated to 300° and upwards, is constructing by M. A. Perkins, Esq., of London, the inventor of the mode of circulating hot water in hermetically sealed tubes (described *Gard. Mag.* vol. viii. p. 292), which will give ample heat for either baking or roasting, and which, we think, promises well, both for public and private establishments.

1512. *Among the Implements and Machines of the Bakehouse* may be reckoned a kneading-machine, of which several have long been in use in Paris, but of which none have yet been permanently adopted in this country, with the exception of that worked by steam in the large establishment at Pimlico. The French strongly recommend a kneading-machine invented by Cavalier and Company, of Paris; one of which was lately exhibited in the National Repository in London, and which will be found figured and described in the *Mechanics' Magazine*, vol. xiii. p. 145. We have seen this machine at the Oxgate Farm bread establishment; where, as well as at Dill's bakehouse, in Oxford Street, where it had been previously tried, it did not give satisfaction to the men; and the masters in both cases were obliged to yield to them. There is another kneading-machine now in progress at Rogers's bakehouse in Snowhill. We do not think there will be any difficulty in getting one perfected, both for kneading common dough and the dough of biscuits; but there must previously be a demand for such a machine; and if bread-eaters, generally, knew as much of the details of the process of breadmaking, and of the economy of the bakehouse, as we do, in consequence of our having lately explored a great number of London bakehouses and ovens, this would soon be the case.

1513. *A Steaming Apparatus* can scarcely be dispensed with in the kitchen of an inn; because steam may not only be used for cooking food, especially vegetables, but also for boiling water; for heating hot closets, sideboards, and even dining-tables; for heating baths however distant from the fire; and, what, in many cases will be of greater importance than any of these, for heating the whole house, but more especially the lobby hall, staircase, and passages. The management of steam is now so generally understood, that it is unnecessary here to dwell on the subject. In Sylvester's *Domestic Economy*

p. 48, will be found described an excellent mode of boiling water by steam. In some of the London club-houses, and particularly in that belonging to the Travellers' Club, which was fitted up by Mr. Jeakes, under the direction of the eminent architect, Charles Barry, Esq., steam is brought most extensively into use in cooking; in heating hot closets, tables, and benches; in boiling water for baths, and for various other purposes. For whatever end a steam apparatus is erected, the boiler ought always to have a manhole for cleaning it out; and this operation ought to be performed frequently, otherwise the earthy material deposited on the metal, being a non-conductor, will render the water every day more difficult to heat, and hasten the burning out of the bottom of the boiler. It may also be remarked, that thin-bottomed boilers of wrought iron, or copper, not only are sooner heated, but last longer, than boilers with thick bottoms, such as those of cast iron. Cast-iron boilers are also much more dangerous, in cases of explosion, than those made of malleable materials.

1514. *Hot Closets* for keeping plates, or food warm, or for other purposes, may be formed in any convenient part of the kitchen, by surrounding them with a double case of iron, into the interstices of which the steam is admitted. The shelves may also be double, and connected with the sides, to admit of their being heated in the same manner. A long kitchen-table, for setting out dishes before they are carried up to the dining-room, may have the centre formed of a double plate, and the steam admitted under it, to keep the dishes hot, while standing there. Hot closets may also be formed under the side-boards in the principal dining-rooms, and connected with the steam apparatus by a pipe.

1515. *An Apparatus for roasting Meat of every Kind by Gas* has been recently invented by Mr. Hicks, the patentee of the improved iron oven, by which spirit is obtained from the exhalations of fermented bread while baking, before noticed, § 1509. This apparatus is so extremely simple and beautiful, that a very few words will suffice to explain it. The gas is admitted to a metallic circle, fig. 1373, *a*, through a very narrow continuous opening, round the outside of which the gas issues, and forms a ring of blue flame. In the centre, supported by two lateral gas tubes joined to the circle, is an upright spike, *c*, serving as a spit on which the meat to be roasted is stuck. From the centre of the circle the pipe, *d*, which supplies the gas, passes down to the gas main, *e*; having a cock, *f*, with a regulating lever, *g*, by which the gas can be turned on or off, and the degree of flame produced can be regulated with the greatest nicety. The circle is raised a few inches above a bench or table, *h*, so as to admit of the introduction of a convex tin dish, furnished with a spout for receiving the dripping, under each spit. From this dish the dripping runs off by the spout, and is collected in any common dish placed under it. Over the bench, at the height of three or four feet, is a projecting boarded canopy or hood, for receiving the heated air and smell from the gas and meat, and conducting them to a flue, so as to prevent them from accumulating in the kitchen. Directly above the gas circle is a cone of polished copper, suspended by a weight. This cone is two inches wider in diameter at the base than the gas circle, and it has a small orifice at the top. When the operation of roasting is to be performed, all that is necessary is to spit the meat, and light the gas, regulating it so as to produce only

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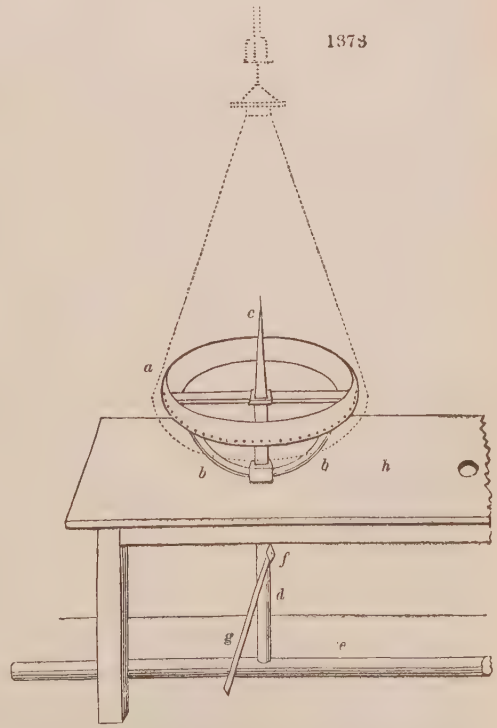

a blue flame, closely resembling a blue riband round the base of a black turban; and then to bring down the copper cone, until its lower edge is on a level with the base of the gas circle. A vessel to receive the dripping is then placed under the spout of the tin dripping-dish, and the process of roasting goes on, without basting or any other operation whatever being requisite. The heat produced by the gas is radiated from the copper cone on the meat, and, this being done equally on all sides, the latter never requires turning, while, the heat not being so intense as that from an open fire, the meat is neither dried nor burned; and, consequently, does not need basting. It is, in fact, roasted by heated air, but air which is constantly renewed; and, therefore, this operation has no affinity with baking. The time required for roasting in this manner is shorter than that before an open fire, in the proportion of about twelve to fifteen; it requiring fifteen minutes for roasting every pound of meat before an open fire, and only twelve minutes for roasting the same quantity by gas. As the cones are nicely balanced, in the manner of chandeliers suspended from lofty ceilings, the cook, when she wishes to look at the meat, can raise and lower the cone hanging over it, with the greatest ease. The fat drops slowly, and as pure as water, into the dish placed to receive it; and when the period of dressing is nearly completed, it is indicated by the appearance of gravy being mixed with the fat. For different joints, and for fowls of different kinds, and game, there are rims and covers of different sizes; and for a sirloin of beef, the cone approaches to the form of a cylinder with a domical top. The operation, when the meat is once spitted, and the gas properly adjusted, is conducted or rather goes on of itself, with all the quiet precision of a chemical process in a laboratory; and, in short, with so much cleanliness, neatness, and absence of smell and heat, that it would not be offensive in a drawing-room. On the evening of January 5. 1833, we were present, along with a number of gentlemen, in Mr. Hicks's kitchen, in Wimpole Street, when a part of a sirloin of beef, a leg of mutton, two fowls, and a pigeon, were roasted in this manner, and afterwards tasted by the company; when they were found to be in all respects equal, if not superior, to meat and fowls roasted in the common way. Mr. Hicks's apparatus had been only erected a few weeks, and was, at the time we saw it, not made known to the public. The expense of gas is much less than might be imagined, the effect being produced not so much by intensity of heat as by its concentration. Mr. Hicks has found sixteen cubical feet of gas, which costs $2\frac{3}{4}d.$, sufficient for roasting twelve or fourteen pounds of meat; which is considerably less than a farthing per pound. When it is considered that bread is baked and browned at from 280° to 300° Fahr., and that meat is roasted in bakers' ovens after the bread is removed, the circumstance of gas affording a sufficient degree of heat for roasting will not occasion surprise. We have before, § 1445, described the mode by which boiling and stewing by gas have been for some time practised in Edinburgh; and it is clear that, as roasting can be also effected by it, so may baking. The whole business, therefore, of the preparation of human food by the application of heat may be performed by gas, and that with great economy, in all families who roast and bake at home. This is only realising what was long ago anticipated by the late William Strutt, Esq., of Derby. There can be no doubt that oil, or any liquid fat burned in the same manner, would effect the same end; and, indeed, this is proved by the portable machine for the use of ships and ambulatory cottages, § 516, invented by Mr. Cochrane, and sold by Josse, in Regent Street. How far the art of cooking by gas will be suitable for country inns, may be considered uncertain in the present infancy of the invention; but as, on calculation, it is found in London to be much cheaper than roasting by open fires of coal, and, for small joints, equally cheap with sending meat to be cooked in a baker's oven, it appears highly probable that, wherever gas is used for lighting, it will answer to employ it also for cooking. In cities, which are now generally lighted with gas, it will probably soon effect an important revolution; for, since every house may be supplied with heat by steam or hot water from public companies, domestic fires will become unnecessary; and, as the smoke may be burned in the engines of all manufactories by Witty's furnaces, our atmosphere may be left comparatively pure, and our town Architecture be displayed to as great advantage as town Architecture now is on the Continent.

Chap. IV.

Designs for Parochial Schools.

1516. *The Subject of the Education of Youth* is one of such vast importance, that we feel some difficulty in entering upon it, in such a manner as to suffice for the object which we have in view; and, at the same time, not to exceed the limits suitable for a chapter treating upon School Architecture, rather than upon school management. The

art of teaching, like all other arts, began by efforts made by individuals on individuals; and it is only in modern times, at least in Britain, that the discovery has been made of the art of teaching children in masses. This art is nothing more than a branch of that general system of improvement which consists in the cooperation of numbers for the good of the whole. We shall make no attempt to trace the history of this art, which seems to have existed for an unknown length of time in India; but it would be withholding what is due to meritorious exertion, not to mention the names of three eminent individuals, who, in modern times, have brought it to the perfection in which it now is. We allude to Mr. Lancaster, who, without any knowledge of what had been done in India, invented a similar system, and applied it in this country; Mr. Wilderspin, who invented, and it may be said perfected, at least in principle, the system of infant instruction; and Dr. Bell, who improved the Indian system at Madras, and afterwards imported it into Britain. Having paid some attention to these three systems of teaching, both in Britain and on the Continent, and looking upon universal education as the grand moral lever which is to raise the human world, we can hardly refrain from entering into the subject at some length; but we must content ourselves with observing that the three modes are essentially one and the same; viz., that of educating in masses; and, that we consider this art as of as great importance in the moral and political world as the invention of the steam-engine is in that of the world of arts and manufactures. It is not one of the least advantages of this system, that it lightens the labours of both the master and the scholar, and renders that an amusement which formerly was a task. We shall first lay down the fundamental principles for designing and fitting up schools of these three descriptions, and next give two or three miscellaneous examples.

SECT. I. *Of the Fundamental Principles, and the Rules derived from these Principles, for designing and fitting up Schools for the Education of Children in Masses.*

1517. *The Education of Children in Masses* comprises that of infants under five years of age, and that of children from that age upwards. The education of infants not five years old must necessarily be almost wholly effected by teachers who have attained the years of discretion; but that of children farther advanced may be in great part effected by the mutual instruction of the children themselves, under the direction and superintendence of a competent master or mistress. This necessarily divides our present subject into two subsections; viz., that of designing schools for training infants, and that of designing schools for mutual instruction. We shall treat the subject very concisely in both subsections, happy in being able to refer to works accessible to all Architects who may be required to design or execute schools; viz., *Wilderspin on Infant Education*, 4th edit. 12mo, 1832, *5s.*; *Brown on the Cultivation of the Infant Mind*, 4th edit. 12mo, 1832, *2s. 6d.*; *Wilson on the System of Infant Schools*, 3d edit. 8vo, 1826, *4s. 6d.*; *Manual of Model Schools of the British and Foreign School Society*, 8vo, 1831, *5s.*; and *Stout's System of Circulating Classes, as an Improvement on the Madras System*, 12mo, 1826, *1s.*

SUBSECT. 1. *Fundamental Principles, and General Rules deduced from them, for designing Schools for Infant Instruction.*

1518. *In the Choice of the Situation* for an infant school, the first consideration is, the physical health of the children; and the next, their moral health. The principle derived from the first consideration is, that the spot should be dry and airy; and the rule deduced from this principle is, that the building should be placed on a site elevated, either naturally or by art, and so that the sun may shine on each of its sides on every day, or on most days, of the year. The principle derived from the second consideration is, that the school should be so situated as not to expose the children to the risk of moral contamination; and, to effect this, it should be a rule always to place infant schools in a decent and orderly neighbourhood. There are other subordinate rules respecting the construction of these buildings, to be derived from these principal ones; which, after what has been said on the subject of drainage, ventilation, cleanliness, and decency, in the preceding pages of this work, we shall leave to the Architect. "Much," it is observed by Mr. Brown, the excellent master of the Spitalfields Infant School, "may be done by forethought and contrivance, to secure healthiness and convenience, and to save expense; and not only so, but to give the children such a prepossession in favour of order, neatness, and cleanliness, as shall lead to the most beneficial results in their after-lives. I could wish," he adds, "for the good of society at large, that the poor were disgusted with the wretched hovels in which they dwell; and which, in London at least, often let for higher rents than comfortable houses." (*Essay on the Cultivation of the Infant Mind.*)

1519. *The Desiderata of the School-room* are, ample dimensions, free air, light, sunshine, and cheerfulness. The rule, therefore, should be, to have high walls, in order to obtain a lofty ceiling; and to have abundance of windows exposed to the sun. The size of the room must depend on the number of children to be instructed in it; and the

maximum for one master and mistress is 150 children. The minimum space for this number of children is 150 lineal feet of bench or form for seats, and at least six square feet for each child for standing room; independently of room for the master and mistress, and the monitors, and without including two or more additional rooms, of not more than a fourth part of the size of the principal one, for giving instruction on particular branches of knowledge to small classes, or to the whole school in a compact mass.

1520. *The Form of the Room* should be deduced from the mode of teaching. One of the principal objects, in an infant school, is to gain the attention of the pupils, and fix it on one person placed on one spot; and hence, the form should be such as to occasion the least possible trouble to the infants in their efforts to direct their attention to the master. It is also requisite that the voice of the master or mistress should be heard equally well in every part of the room by every infant, without effort on their parts. "If," says Mr. Wilson, "the master be obliged to raise his voice, in order to be heard by those who are at a greater distance than others, his tone will almost necessarily seem to approach to that of anger, and the good feelings of his little flock will, in consequence, be disturbed; while on the other hand, distance will encourage carelessness in those whose attention is not yet sufficiently secured."

1521. *A Model Design, in conformity with these Principles*, fig. 1374, is given in Mr. Wilson's work, in which *a a* are seats round the room; *b*, a double rostrum, in the front part of which the monitor (who is to lead the rest when the school is engaged in a united lesson) takes his stand; and on the back part of which the superintendent places himself whenever he may wish to obtain the attention of the whole school at once, and to convey a lesson to them all at the same time. There is a gallery, *c*, in which all the children may be occasionally assembled within a smaller compass, for general examination. This gallery must have seats, at least equal, altogether, in length, to all the other seats round the room. There are seats, *d*, against the wall behind the rostrum. The advantages of a room in the form of a broad parallelogram over a narrow one are, that the distance of the several seats from the rostrum approaches more nearly to equality, and that the eyes

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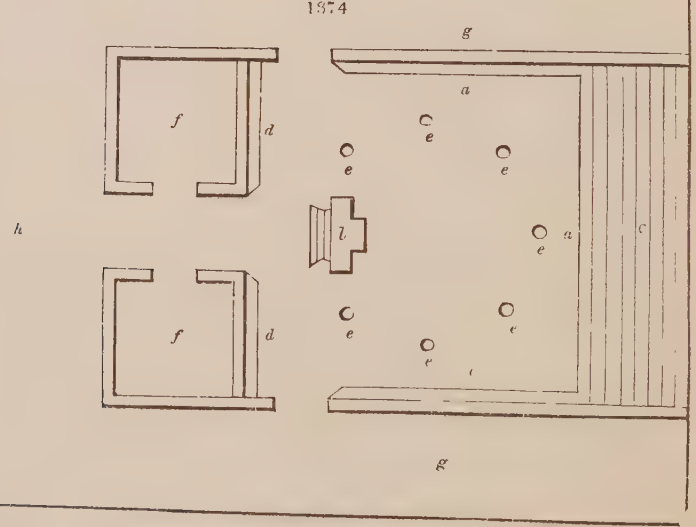
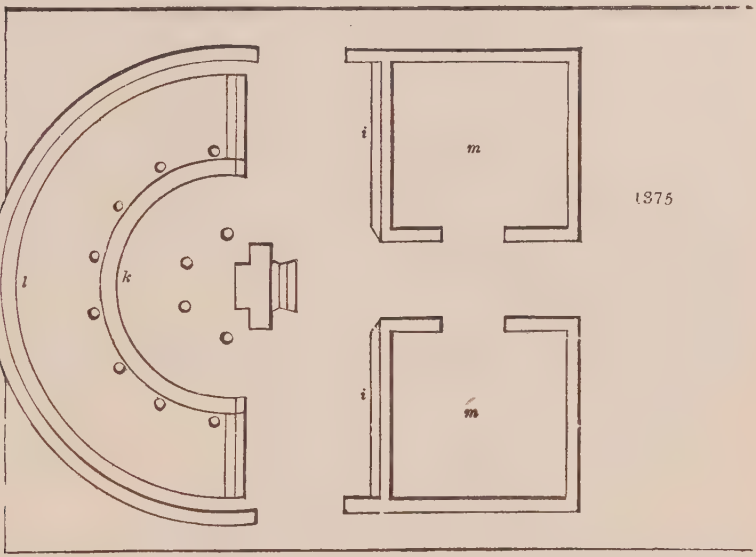


of the children are more easily directed to that point. The seats for the monitors, *e*, must be placed at a sufficient distance from the benches against the walls, to leave room for the free passage of the children when they walk round the school two and two. They should be placed at the terminating line of each class, and be so broad as to allow the monitors room to stand upon them when the lesson is given out from the rostrum. There are two smaller rooms, *f*, one of which, at least, forms an essential part of the infant school, for giving instruction in separate classes. One may be used for boys and the other for girls; or one may be used for school furniture or lumber. There is a yard, *g*, embracing three sides of the school, and which may be extended in the direction of *h*.

1522. *Another Model Design*, fig. 1375, is given by the same author, and is preferred by him, because in it the children may be so arranged in the circumference of a circle, as that their eyes, necessarily, and without effort, are directed to the rostrum. All the children



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are here equidistant from the acting monitors or superintendents. From the position of the scholars, also, the necessity for a raised gallery is removed. The more advanced, whose examinations will principally take place in the class room, will be seated along the straight wall, *i*. Those next in progress will occupy the inner circle of seats, *k*; and the smaller children will take their seats on the benches, *l*, attached to the circular wall. The roof of this place should be so constructed as not to reverberate the sound, for which purpose it should be without a ceiling. There are two class rooms, *m m*, to this Design, and a yard embracing it on three sides, as in the preceding one.

1523. *The Form of the School-room*, according to Mr. Wilderspin and Mr. Brown, ought to be rectangular; and fifty feet long by twenty-five feet wide will, they say, contain as many infants as the most laborious master and mistress can conveniently manage. The middle of the room is kept quite clear of fixed seats, and the height, to the roofs, should be fifteen or twenty feet, without any intervening ceiling, as that is found to produce echo. In addition to a room of fifty feet by twenty-five feet, there should be at one end a gallery fourteen feet wide and fifteen feet deep, and a class-room ten feet wide and fourteen feet deep. The gallery is fitted up with steps rising above each other, for the purpose of instructing the children with greater facility in particular branches. The first bench or seat in this gallery should be seven inches high, and seventeen inches in depth; the second should be seven inches and a half high, and the same in depth; and so on, increasing in height half an inch in every seat, till the ten seats which the space affords are completed. The class-room, which is placed alongside of the stage or gallery, is fourteen feet by ten feet, on the plan, allowing one foot for a partition between them. At the end of this class-room a stage of two or three seats is erected for the larger children. The large room is fitted up with seats round its sides, from six inches and a half to nine inches and a half in height, and eight inches wide, with a small bead or fillet nailed on the floor, about a foot from the seat, as a line of demarcation for the children's feet. The wall is covered with boarding to the height of four or five feet, terminating in a row of hat pins. The portion of sitting-room allowed by Mr. Wilderspin for each child is twelve inches in length; so that a school fifty feet long, and twenty-five feet wide, with a bench along three sides, and two doors into the gallery and class-room at one end, will contain from 125 to 150 infants.

1524. *A Play-ground and other Conveniences* should be connected with each school; and Mr. Wilderspin is of opinion that this play-ground should not be less than 150 or 200 feet long, and 50 feet wide, for a school of the size above-mentioned; Mr. Brown, when speaking of London Infant Schools, says, fifty feet by twenty-five feet will be large enough for a play-ground for 150 children. Much will depend on the age of the infants.

One object for inducing children to play together is to give them a knowledge of one another, and to elicit their individual character, so as to enable the master and mistress to apply instruction accordingly. For this purpose, in the case of very young infants, concentration must be more favourable than dispersion; and, consequently, the size of the play-ground must be regulated by the size of the infants.

1525. *The House for the Master and Mistress* should be connected with, or contiguous to, the school; and should, at all events, command a complete view of the play-ground, in order to enable them to look over the children during their dinner-time. The places of convenience should not only be near the school, with a covered way leading to them, but there should be small windows looking into them, from the class-room, or some other convenient situation, through which the master or mistress may, when a child has been long absent, ascertain in the easiest manner that no accident has befallen it.

1526. *The Accommodation of the House for the Master and Mistress* should consist of at least two sitting-rooms, one for constant use, and the other, in which there ought to be a school library, for receiving visiters. The kitchen and other conveniences ought to be in proportion; and in the country there ought always to be a garden, not only for the supply of vegetables to the master and mistress, but for their recreation and enjoyment during the hours of leisure.

1527. *The Infant School, near St. Vincent's Square, Westminster*, may be considered a very good model for a country infant school. It is placed in an irregular piece of ground serving as a yard, and consists of one large room, fig. 1376, *a*, forty-two feet by twenty-

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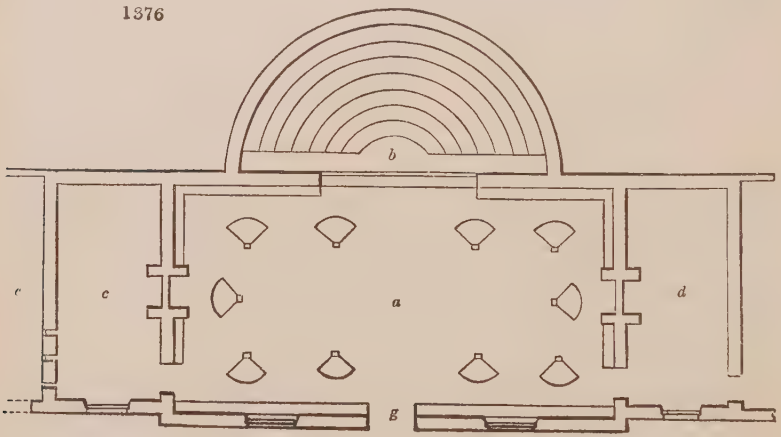

two feet, with seats on each side; one fire at each end; two large ventilators in the ceiling; and with sliding doors opening into a gallery, *b*. There are about one hundred feet of seats, so that the school may be considered as adapted for that number of children. At one end is a class-room, *c*, and at the other is the house of the master and mistress, *d*. There are yards and lean-tos at each end; one at *e*, for the children; and another at *f*, for the master and mistress. From the class-room, *c*, there are small holes filled in with panes of glass looking into the yards, through which, when any child has stayed out longer than ordinary, the master or mistress can ascertain, without trouble, whether or not an accident has happened in that part of the premises. The whole of the front yard can be inspected in a moment from the entrance-door, *g*. This school was established through the influence of Mr. Owen; and the present excellent teachers, Mr. and Mrs. Buchanan, were brought to superintend it from Mr. Owen's establishment at New Lanark. Every child brings twopence with him on the Monday morning, which is understood to pay for his week's instruction, or, in other words, the salary of the master; the rent, taxes, and expenses of heating and lighting, being paid by the patrons and subscribers to the school.

Subsect. 2. *Fundamental Principles, and Rules deduced from them, for designing Schools for Mutual Instruction.*

1528. *Schools for Mutual Instruction* are of two kinds: those on the Madras or Bell's system, or on the improved system founded on it by Stoat, the characteristic of both of which is, that the school is at all times taught in separate classes; and those on the Lancasterian plan, by which the greater part of the teaching is carried on while the

school is formed into one class. We shall first notice what is common to both systems, and afterwards describe each system separately.

1529. *The Systems of Bell and Lancaster* agree in what is necessary for all schools; viz., in being placed in a dry, airy, light, warm, cheerful, and respectable situation. They agree also in requiring ample school-rooms, and a general form, nearer a square than a narrow parallelogram, for the more ready inspection of the whole school by the master or mistress: in most other particulars they differ.

1530. *By the Madras System,* the children are taught in classes forming squares; and as these squares may be increased or diminished at the pleasure of the teacher, almost any form of room will suffice for carrying on either this mode of teaching, or the very superior variation of it by Stoat, denominated the circulating system. On the supposition that the squares are nine feet on the sides, this will give, at eighteen inches in length of form for each individual, eighty-one feet for twenty-four scholars, or about four superficial feet for each, deducting the space of one scholar for the room occupied by the monitor. It may be remarked, both of the original system of Bell and of the improvement on it by Stoat, that no author who has written on either has ever given or described one plan or form for a school, as preferable to another; a clear proof that no particular form is necessary.

1531. *The School on the Madras System, in Baldwin's Gardens,* is shown in the ground plan, fig. 1377. It is divided into nine squares, six of which are shown with the forms, *a a a*, on three sides; the fourth being occupied by the teacher. In each square there is a box for books, &c., *b*; *c c* are cast-iron columns which support the roof. Three of the nine squares which compose this school are shown vacant, merely because at the time we took the plan (Nov. 1832), there happened not to be a sufficient number of scholars to fill the school. Against the four exterior walls there is a continued writing-desk, *d*, with a form before it, *e*. There is a cupboard for books and papers in one corner, *f*; and an entrance-door at another, *g*. Adjoining this school is one for girls, of exactly the same plan and dimensions; and on examination days, and times of public display, the two

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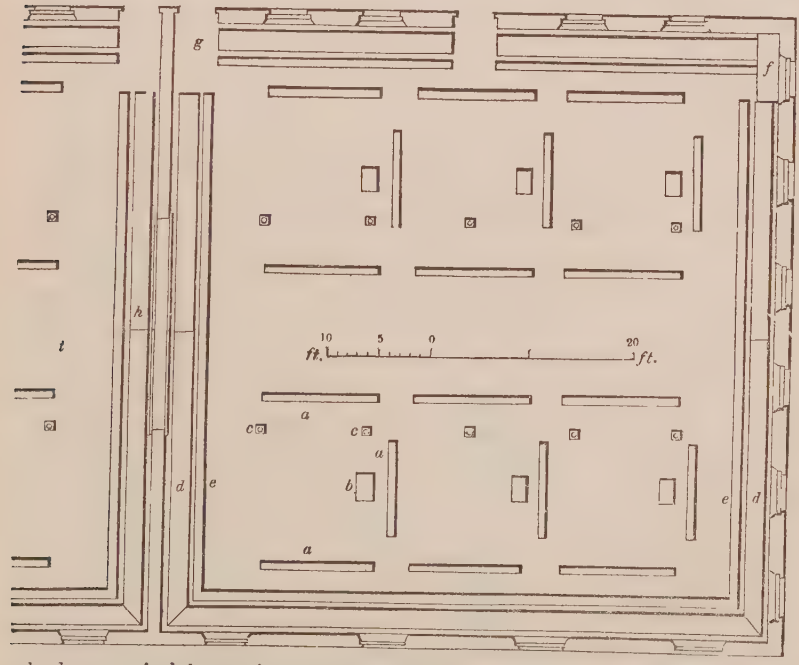

schools are united by opening the sliding doors at *h*, and the children of both are arranged along the open space, *i*, down the middle. To admit of this, the desks which are placed against the door, *h*, are movable; but all the others are fixed. There is a play-ground beneath each school, of the same size as the apartment over it, and a small yard, with the usual conveniences. The space from the floor to the roof of these schools is open, as indicated by the cross section, fig. 1378; in which there are windows for light

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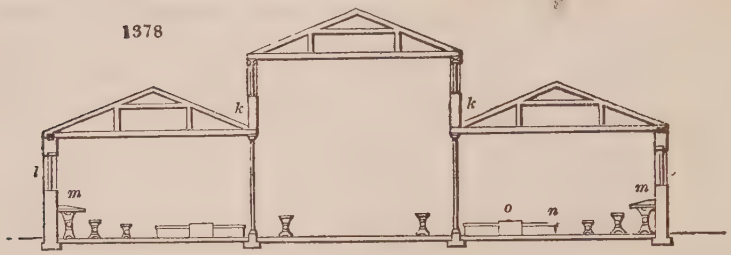
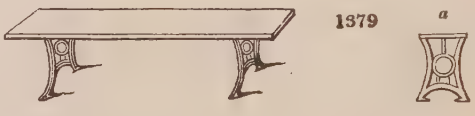
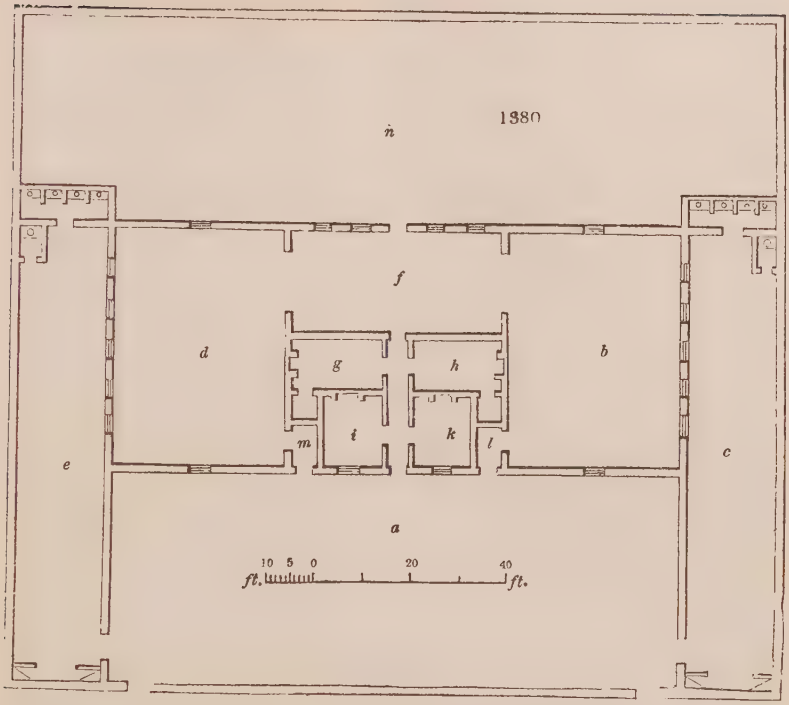


and ventilation at *k k* and *l l*: the desk round the wall is shown at *m*; the box for books at *n*, and the forms at *o*. The room is heated in cold weather by stoves. The master has a movable desk and seat on castors, so that he can fix his position in any part of the room that he may choose. The forms, fig. 1379, are supported by cast-iron feet, and the desks against the walls by cast-iron brackets. Each school is a square of sixty-one feet on the side, and is capable of containing three hundred scholars, that is, twenty-seven forms of eleven or twelve scholars each. The boys' school is managed by one master and nine subordinates; the girls' school by a mistress, with a subordinate for each class; and there is a head-master, or rector, who has the general inspection of both schools, and is himself under the guidance of a committee of management. The scholars pay a trifle weekly.

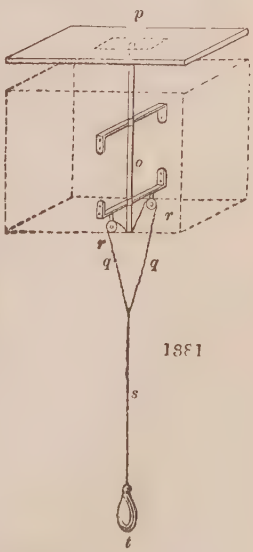
1379 *a*



1532. *The Circulating System of Stoat*, of the Islington Parochial School, is so great an improvement on the Madras system, that it can hardly fail to be substituted for it by all who are so circumstanced as to be able to examine both systems without prejudice. As far as architectural objects are concerned, it may be sufficient to observe, that, by the Madras system, the children are arranged on three sides of squares; while by Stoat's system, they are placed in the circumference of a circle, or in those of concentric circles. Hence, for this plan, there ought to be no forms or fixtures of any kind in the centre of the school; and hence, also, double the number of scholars can be taught in the same space. For example, within an outer circle of sixteen feet in diameter, boys may be placed in concentric circles, so as to include ninety-one in a single class. But the great advantage of the circulating system, according to Mr. Stoat, is, that the superior and inferior children are constantly mixing together in every part of the class; and that the former are every where at hand, to assist the latter by their instruction and example. By the Madras system, the school is arranged into classes composed of children of the nearest degrees of proficiency; and, as soon as any of the boys begin to evince any superiority over the others, they are placed out of the reach of their inferiors; that is, at the head of the class. By the circulating system, on the contrary, all the children in the circle are continually changing places; and, instead of merit being indicated by the position of a boy at the head of his class, it is marked by the number of times that he has circulated round it; he receiving a badge marked with a fresh number every time he passes a certain pole fixed in the ground for that purpose; and at the conclusion of every week the boys possessing the highest numbers become entitled to medals. But we refer the reader to the interesting little work of Mr. Stoat before-mentioned, § 1517, which deserves to be in the hands of every teacher whose mode of conducting his school is founded on the Madras system; indeed, in the hands of all teachers whatever. We have, in perusing this work, been delighted to find so much improvement introduced by a single individual into a system which was before considered to be nearly perfect. We have had a plan taken of Mr. Stoat's school, fig. 1380. It occupies, including the yards, about an acre of ground, and contains a master's house, a boy's school and yard, a girls' school and yard, an extra-school for either boys or girls, and a master's garden. Here are a gravel court of entrance, *a*; school for boys, *b*, with its yard, *c*; a school for girls, *d*; with its yard, *e*; an extra-school for supernumeraries, or for teaching particular subjects, *f*. The master's house contains a kitchen lighted from a skylight, *g*; a back-kitchen lighted in the same manner, *h*; a committee-room, *i*; and parlour, *k*; besides closets and other conveniences on the ground floor, and four bed-rooms over. There is an entrance porch, *l*, to the boys' school, and another, *m*, to that of the girls. There is a large garden, exclusively for the use and enjoyment of the master and mistress, *n*. The dimensions of the schools, *d* and *b*, are forty-eight feet by thirty-six feet; and in each of



them may be taught 400 children. The circles round which the children are to stand are drawn on the floor with chalk: there are writing-desks round the walls as in the Madras school in Baldwin's Gardens, fig. 1377, and writing is also taught on slates. The schools are well lighted from the south-east and north-west; and in the roof are ventilators formed in the manner shown in fig. 1381, in which the iron spindle which supports a board, or the pane of glass, *p*, is raised by two lines, *q*, passing over the pulleys, *r*, when the card, *s*, is pulled by a person standing on the floor of the school. The weight forming the handle, *t*, is such as to balance the ventilator in whichever position it may be placed.



1381

1533. *By the Lancasterian System* the children are placed in lines across the room, with a form and desk to each line, and are chiefly taught in one mass when so placed; but they are also taught in small classes in the form of semicircles round the room. The desiderata for a school to be taught on this system have been given in a very complete manner in an appendix to the work, already named, entitled *Manual of the Model Schools of the British and Foreign School Society*, from which we shall make a succinct abridgment.

1534. *The Situation of the School* should be retired and quiet, and the ground high, and open to the south. To preserve the pupils from the inconvenience of cold and damp, it will be better to raise the ground two or three feet above the surrounding level. There should be a play-ground or yard, in which the children may assemble before they go into school, or during the hours of recreation. The soil of this yard should be of gravel, to the depth of one foot. It should be enclosed by a wall of suitable height, and have a communication with the street or road, without passing through the school-room. There ought to be a good supply of fresh water, either from a pump, or a cask or cistern, with conveniences for the children to wash their hands and faces. One side of the yard

should be furnished with seats, and a part covered, in order to protect the children from inclemency of weather.

1535. *General Arrangement of the Schoolroom.* The schoolroom should be a parallelogram, the length about twice the breadth. The height of the walls should be proportioned to the length of the room, and may be varied from eleven to nineteen feet. They should be worked fair, and lime-whitened, in order to give a neat and clean appearance, reflect light, and contribute to the preservation of health. There should be a considerable number of windows, each of which should be fixed in a wooden frame, and movable upon pins or pivots in the centre, so that, by drawing the upper part into the room, the lower part may project outwards, so as to admit air above and below; by which means the school may be sufficiently ventilated in hot weather. The lower parts of the windows should be at least six feet from the floor, in order that the light may not be inconvenient, and the wall be at liberty for the boards or placards containing the reading-lessons, &c., which are attached to it: if piers or buttresses are required, they should be on the outside of the wall. Fig. 1382 is a plan of a Lancasterian school for 304 children. It is sixty-two feet six inches long, and thirty-four feet wide, inside measure. It contains nineteen forms, *a*, for holding sixteen children each; and with a desk, *b*, to each form. There is a platform at one end, *c*; a desk for the master, *d*; and twenty-eight semicircles, *e*, for small classes of nine children each. The situation of the monitor-general is at *f*; of the monitor of the writing classes at *g*; and of the monitors of inspection at *h*. The diameter of the semicircles is four feet, and the passage between the wall and the forms five feet; *i i* are two doors opening into the adjoining road or street; and *k*, a door opening into the play-ground. The roof should be slated on boards, in order to prevent the reverberation of sound which is frequently occasioned by plastered ceilings. When this reverberation takes place, it may always be checked by suspending pieces of baize from the ceiling, from one side of the room to the other; and these may be so festooned as to form an agreeable drapery. Openings, with sliding covers for ventilation, should be formed under the eaves. All projections in the walls, as well as pillars to support the roof, ought to be avoided; for they interfere with the arrangement of the school, and obstruct the view of the master and of visiters. If pillars are necessary, they should be placed at each end of the desks, but never in the middle of the room. The floor may be paved with bricks or tiles, or prepared with a mixture of clay, slacked lime, and scales of iron from a smith's forge. The earth being previously levelled and consolidated by a heavy roller, or by ramming, the mixture should be applied, and well beaten down. Wooden or stone floors are objectionable, on account of the noise they produce by the trampling of the feet.

1536. *A good Flooring* may be formed of Roman cement, cast into flags, and jointed with the same material; it is perfectly dry and durable, and emits but little sound.

1537. *In order that all the Children may be completely seen by the Master,* it is of great importance that the floor should be an inclined plane, rising one foot in twenty from the master's desk, to the upper end of the room, where the highest or eighth class is situated. At the lower end is the platform, elevated, in proportion to the length of the room, from two to three feet. The length and breadth of the platform must be in proportion to the size of the room. The centre of the platform is the place for the master's desk; and on each side there may be a small desk for the principal monitors.

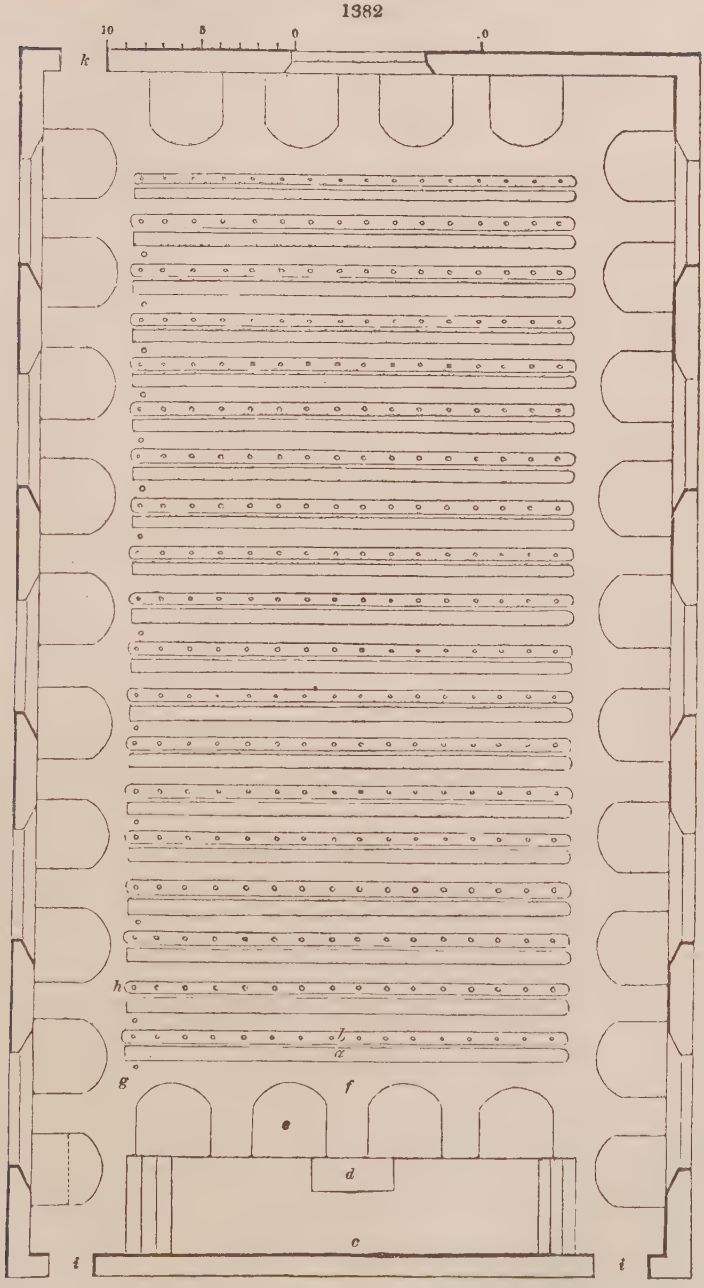
1538. *The Entrance-door* should be on the side of the platform, in order that visiters, on entering the school, may have a commanding view of all the children at once.

1539. *The School may be warmed,* whatever may be its size, by means of one or two stoves placed at the extremities of the apartment. But the most uniform temperature is obtained by steam or hot water, when conducted along the lower parts of the room, through pipes; or by heated air conveyed into the room through tubes communicating with a stove, which is surrounded by a close casing of iron, having a sufficient space for a current of fresh air to be brought in through a tube: the current of air coming in contact with the stove, and the outside of the flue, or iron chimney, which passes through the casing, is heated, and may be discharged into the room by means of iron pipes. This method has been found to answer extremely well.

1540. *The Forms and Desks* occupy the middle of the room, a passage being left between the ends of the forms and the wall, five or six feet broad, where the children form semicircles for reading.

1541. *The Forms and Desks* must be fixed firmly in the ground; the legs or supports should be six inches broad and two inches thick: but cast-iron legs are preferable, as they support the desk-board with equal firmness, occupy less room, and have a much neater appearance: their number, of course, will be in proportion to the length of the forms. A form twenty feet long will require five; and they must be so placed, that the supports of the forms may not be immediately opposite to those of the desks. The corners of the desks and forms are to be made round, in order that the children may not hurt themselves.

1382



1542. *The Desks of the Writing Classes* are arranged next after those of the first or sand class (those who write in sand): they are to be four inches higher than the latter. The forms are six inches broad, and sixteen inches in height. The desks are inclined planes, rising two inches: they are nine inches broad, and are furnished with beads along the least elevated sides, in order to prevent the slates from falling and being broken. At

the right-hand extremity of all the desks a board is fixed perpendicularly in the ground, and nailed against the further side of the desks. This board is of the same breadth as the desk, and rises about one foot and a half above it. Upon this the dictating lessons and class marks are to be hung.

1543. *Telegraphs* are small boards, six inches long and four inches broad. One of these boards is attached to each class, except the first. Upon one side of the board is inscribed the number of the class, and on the other the letters E X. The telegraphs are made to turn freely on an iron rod, about twelve inches in height, the other end of which is firmly screwed into the perpendicular standard at the end of the desk: by furnishing the top of each of these standards with a screw nut, the telegraphs may be changed from one to another, as occasion requires.

1544. *Drawers for the Pencils.* In schools situated in a country where slate pencils are dear, it is best not to allow the children to take away the pencils with them when they leave the school: the pencils may in that case be deposited in drawers placed under the first desk of each class.

1545. *Semicircles for Reading.* On the floor of the passages, semicircles are formed opposite to the wall: they may consist of a wooden or iron hoop sunk in the ground to the level of the pavement, or be marked by an incision in the floor, which will be found to answer better. Round these semicircles the children are to be arranged for reading. The diameter of each semicircle must be four feet, and a space of two feet and a half should be left between each of them. The passages, in a school of more than three hundred children, should be six feet broad; in a school of from one hundred to three hundred children, the breadth of these passages should be five feet; in a very small school, the desks may be brought close to the wall on one side, and passages of five feet left on the others. Each semicircle will contain nine children, or from that to twelve, if they stand close to each other. When the number of children in attendance is greater than can be accommodated in the passages of the school, one or two classes may remain in their seats, and continue at those exercises which are performed sitting; or they may be arranged in small divisions between the desks, by suspending the lesson on a movable standard, which may be inserted in a staple fixed at the edge of some of the desks, at convenient distances; but it rarely happens that this is necessary, as experience proves that a considerable number of the children are always absent, on account of illness, and from various other causes.

1546. *Slates and Pencils* are substituted in these schools for paper and pens, which are only used by those children who have made considerable proficiency in writing. This plan is economical; and greatly accelerates the progress of the children. The slates should be of an even grain, ground flat, and polished; the red slate is generally harder than the blue, and answers remarkably well. The pencils must be made of the softest kind of slate, that they may be more easily pointed, and leave a fuller and clearer mark; the flat slate, being harder, grinds off a portion of the pencil at every stroke. The slates are to be about a quarter of an inch in thickness, and without frames. The slates of the second, third, fourth, and fifth classes are five inches broad and eight inches long; those of the sixth are five inches broad and nine inches long; those of the seventh class are five inches broad and eleven inches long; and the slates of the eighth class are five inches broad and twelve inches long. All these slates have a hole made in them, through which is passed a piece of string, well twisted, by which they may be suspended. The length of this double string is from three to five inches: they are hung upon round-headed screws. These screws are fixed upon all the desks in the school, except those of the first class, at the distance of half an inch from the highest edge; and serve to mark the seats of the pupils, opposite which they should be placed. The distance between two screws should be eighteen inches, or fifteen inches, if no more space can be allowed to each child. The first screw in every desk should be placed at half the distance allowed to each child, or at nine inches from the end; in this manner every pupil will have his slate suspended opposite to him. It is found convenient, in some schools, to fix a rail under the desk board, at about two inches from its under surface, for the purpose of holding the slates. In small schools, where it is necessary to fix the desks very close to each other, with the view of saving room, this arrangement is indispensable.

1547. *Paper, Pens, and Ink.* Most of the pupils in the eighth class write occasionally upon paper. They must each of them, therefore, be provided with a copy-book and pens: these, as well as penknives, may be distributed as rewards. The copy-books are placed in a drawer of the master's desk.

1548. *Copies for Writing.* The children who write in copy-books are all provided with engraved copies, which they are to endeavour to imitate. These copies should be very short; one or two lines are sufficient: they are pasted upon thin pieces of wood, to preserve them. The copies give examples of large or small letters, and of words written in large or small hand, or in running hand.

1549. *Alphabet Board.* This board is from twenty to thirty feet long, and two feet broad. The letters of the alphabet, both large and small, are painted on it, in the writing character. The large letters should be written in one line, on the upper part of the board, and the small ones immediately under them. The board is painted white, and the letters black. The board should be fixed against the wall of the room, behind the master's platform, and at such an elevation as to be conveniently seen by all the children in the school.

1550. *Lesson Boards, &c.* All the lessons used in the school are printed on sheets of paper, in a large type, and pasted on each side of boards half an inch in thickness. The boards for the smaller dictating lessons have handles by which they may be held, and which preserve them from being torn or soiled. When these boards are not in use, they are suspended in regular order, according to their numbers, from screws, which are fixed in a rail, attached to the walls of the schoolroom, at the height of six feet from the floor. This rail should be six inches wide, and one inch thick. A second rail is fixed against the wall, parallel to the above, of the same dimensions, and at the height of four feet from the floor: on this rail the lessons are to be suspended when the children are reading: a pointer, and a badge for the first boy, are also hung on this rail, at each semicircle or reading station.

1551. *Badges and Class Marks.* Each class is furnished with a set of these marks: they are small labels, which describe the offences common in all schools, as " Talking Mark," " Idle Mark," " Dirty Mark," &c. There are also badges of approbation, as " Good Mark," " First Mark," &c. These marks and badges are pasted on boards, and suspended from the standard at the head of each class. By the help of these marks, the monitors are enabled to report to the master the good or bad conduct of the children under their care, without leaving their places, or neglecting their classes.

1552. *Class Lists.* These lists are used to mark the attendance of the children at school, and show to what class they belong: they are fixed on boards in such a manner as to be easily removed without defacing them, in order that they may be preserved when filled up: they are suspended in a convenient place in the schoolroom.

1553. *Pointers* are small sticks used by the reading monitors, to direct the attention of the children while reading. they are about two feet in length, and their termination should be round, in order that the children may not hurt themselves. One of these pointers is suspended on the lower rail, against the school wall, at every reading station.

1554. *The Bell.* A small hand bell is used to direct the movements of the children, in order as much as possible to avoid verbal commands: it should be placed on the master's desk. It is also desirable that a large bell should be fixed on the outside of the building, to assemble the children at the appointed hours.

1555. *The Whistle.* The master makes use of a whistle to enjoin silence. This should be placed on the master's desk.

1556. *The Clock.* A clock should be fixed to the wall behind the master's desk.

1557. *Registers and Report Books.* These are four in number: 1st, Register of candidates for admission; 2d, Alphabetical or school register; 3d, Report of daily attendance; 4th, Report of attendance on religious worship on Sundays: besides which, sundry small books are kept in the master's desk, as reward books, a book to receive the names of visiters, the inspector's report book, &c.

1558. *The Library.* The school should have a collection of entertaining and instructive books, chosen by the committee, which may be lent to the best pupils in the school, as a reward for their good conduct. The library is placed upon the platform behind the master's desk.

1559. *General Rules for fitting up Schoolrooms.*

1. The space or passage between a form and the desk is one foot.
2. The horizontal space between a desk and its form is three inches.
3. The breadth of a desk is nine inches; the breadth of a form six inches.
4. The height of a desk is twenty-eight inches; the height of a form is sixteen inches.
5. Every child, being seated upon his form, is allowed a space of eighteen inches in length of the desk.
6. The passage between the walls and the ends of the forms and desks, is from five to six feet.

1560. *Dimensions of a Schoolroom for 500 Children, the same Rule to be followed for a larger Number.* Length, eighty feet and a half; breadth forty-two feet. Viz., length of platform, six feet; passages, twelve feet; twenty-five desks, two feet and a half each, sixty-two feet and a half: total length, eighty feet and a half. Breadth of passages on both sides, twelve feet; length of desks, thirty feet: total breadth forty-two feet. Allowing eighteen inches to each child, one desk will hold twenty: 20 by 25 equal to 500.

1561. *Dimensions of a Schoolroom for 400 Children.* Length, seventy-five feet and a half; breadth, thirty-seven feet and a half. Viz., length of platform, six feet; passages,

twelve feet; twenty-five desks two feet and a half each, fifty-seven feet and a half: total length, seventy-five feet and a half. Breadth of passages, twelve feet; length of desks, twenty-five feet and a half: total breadth, thirty-seven feet and a half. Allowing eighteen inches to each child, one desk will contain seventeen; which, multiplied by seventy-three, gives 391 seats; a number sufficiently near, since, as before mentioned, some children, in every school, are always absent from sickness or other causes.

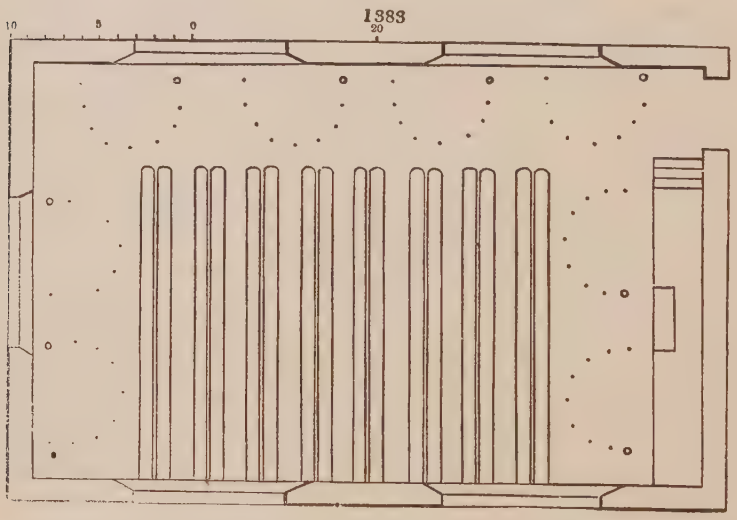
1562. *The Dimensions of a School for* 300 *Children are* sixty-two feet and a half by thirty-four feet, inside measure. The space is thus disposed of: length of the platform, five feet; passages, ten feet; nineteen desks, two feet and a half each, forty-seven feet and a half: total length, sixty-two feet and a half. Breadth of passages, ten feet; length of desks, twenty-four feet: total breadth, thirty-four feet. As each desk will contain sixteen children, nineteen of them will seat 304.

1563. *The Dimensions of a Lancasterian School for* 200 *Children should be Fifty-five Feet long and Twenty-eight Feet broad.* Viz., platform, five feet; passages, ten feet; sixteen desks, two feet and a half each, forty feet: total length, fifty-five feet. Breadth of passages, ten feet; length of desks, eighteen feet: total breadth, twenty-eight feet. As each desk will contain twelve children, sixteen will contain one hundred and ninety-two.

1564. *For a School to contain* 150 *Children,* the length should be fifty-two and a half feet, and the breadth twenty-five feet. The width of the platform and of the passages, in this case, are the same as in the last two; and the length of the desk will, therefore, be fifteen feet. The width occupied by each desk, including its form, being two feet and a half, there will be fifteen desks for ten children each.

1565. *For a School to contain* 72 *Children* the ground plan may be thirty feet long, and eighteen feet wide, inside measure, arranged as in fig. 1383.

1383



1566. *For a Village School to contain* 40 *Children,* the inside dimensions may be sixteen feet by sixteen feet; and it may be furnished with a master's desk, fig. 1384, *a*; five desks, each eleven feet long, *b*; and four class circles, *c*.

1567. *The Expense of building a Schoolroom* will vary in different places, according to the price of materials, and other circumstances. A very complete brick schoolroom, with a slated roof, capable of containing 300 children, has been built, in the neighbourhood of London, for about £400. As the difficulty in raising funds for the buildings has been one of the great impediments to the establishment of these schools, we recommend the following plan, which has been successfully acted upon.

1568. *Tontine System of School-building.* When the amount of the contract for the intended building is ascertained, let the sum be divided into a certain number of shares, each of which shall bear an interest of £5 per cent during the life of the subscriber; but at his death, the principal is to fall into the school fund, and his proportion of interest is to be paid to the survivors. Suppose the total sum £500, and there were fifty subscribers of £10 each; the total charge of interest would be £25, and this sum should be annually divided among the survivors equally, until the remaining one would receive at the rate of £25 per annum upon his £10 share. All the parties should have security

upon the building, and this security would become more and more valuable in proportion to the decease of the subscribers. There must, of course, be a limitation as to the age of the person subscribing.

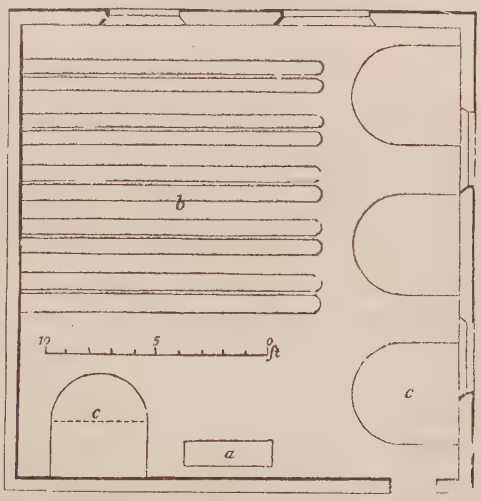
1569. *Expense of fitting-up a School for* 120 *Boys.*

	£	s.	d.
12 desks and forms, 12 feet long, with legs complete	12	0	0
Sleepers in the floor, for them to rest upon, and to be fastened to	1	0	0
100 lesson-boards, at 4*d.* each	1	13	4
Master's desk	1	0	0
4 windows, 3 feet by 4 feet, glazing and framing	4	0	0
Total	£19	13	4

1570. *The Annual Expense of Schools upon the Lancasterian Plan* will consist principally of the following items: rent, master's salary, lessons, slates, &c. (which will cost about £15 per annum for a school of 400 or 500 children), rewards, fuel, &c.

1571. *The Expense of educating a Child* is from 4*s.* 6*d.* to 12*s.*, according to the size of the school; for, as the salary of the teacher is the principal expense, and as one only is required in any case, the larger the number of children the smaller the charge will be per head. One set of lessons, &c., will, if carefully used, be sufficient for the use of schools of from 100 to 500 children, for several years. (*Manual of the British System*, &c. p. 79.)

1384



1572. *A Country School*, whether for infants or other children, but more especially in the latter case, ought always to be accompanied by a certain extent of garden ground; in order that all children may be taught experimentally something of botany, and of the universal arts of gardening and agriculture. A girls' school should, in our opinion, always be accompanied by a kitchen completely fitted up with a stewing-hearth, roasting or baking oven, &c., in order that they may be taught experimentally the most useful part of cookery, the art of making the most of human food. Besides a garden, we would have a large apartment, in which should be placed various descriptions of tools and benches, to teach the boys the more common mechanical exercises, particularly those of carpentry and masonry. Adjoining the girls' kitchen there should be a washhouse and laundry, in which the arts practised in these places should be taught them; and in the general schoolroom they might be taught all the different kinds of sewing and making clothes, and every other description of housewifery.

1573. *The Extent of Garden Ground* which ought be attached to a country school will vary according to circumstances; but, to contain a tolerable collection of useful plants, and to afford space for displaying different kinds of culture, it should, in the very smallest schools, never be less than half an acre. The children may be taught the names of the plants, their natural history, and the different operations of culture, with the scientific reasons on which these operations are founded. Pursuits of this kind are so congenial to man, that very little instruction would be sufficient; and it might generally be given rather as a reward for good conduct than as a task. Believing, as we do, that the happiest state of society is that in which the majority, whether employed in agriculture, manufactures, or commerce, shall possess each a house, and a small portion of land, either adjoining it or detached from it; and believing, also, that the progress of things is approaching to this state even in Britain, we attach considerable importance to the instructing of the rising generation in these pursuits; not only as tending to create in them a desire for this state of things, but to fit them for the enjoyment of it when obtained. In Wirtemberg and Bavaria, where the system of parochial schools is far in advance of those in any part of Britain, land is attached to every school-

house, and the children, all of whom are obliged to be kept at school from infancy to the age of puberty, are not only taught agriculture and gardening by catechisms and other books, but practically in the parish garden. Much might be written on this important subject; but we have no wish to say more here, than to awaken the attention of the Architect to the requisites for a country school and its appendages. He will find farther details in our pamphlet *Des Etablissemens pour l'Education publique en Bavière, et dans le Wirtemberg, et à Bade*, &c., published at Paris, in 1829, and to be had of Treuttel and Würtz, London; and to our article entitled *Parochial Institutions; or, an Outline of a Plan for a National Education Establishment*, &c., in the *Gardener's Magazine*, vol. v. p. 692.

Sect. II. *Miscellaneous Designs for Parochial Schools.*

1574. *Our Miscellaneous Designs for Parochial Schools* are few, principally because we have already said so much on the subject in our section on Model Designs.

Design I. — *A Parochial School, in two Stories, for 400 Children, with a House for the Master and Mistress.*

1575. *The Object of this Design* is to show how the accommodation required may be obtained by placing one schoolroom over another, and the whole executed in an economical manner, and at the same time with some regard to architectural style. The Design has been executed, and it was furnished to us by its Architect, I. J. Kent, Esq., of London; a gentleman who has made himself fully master of the subject of schools, both by study and the examination of the principal erections of this kind in England. Mr. Kent has besides designed and superintended the execution of some of the handsomest and best schools about London. We shall give elevations of the Design before us, and leave the young Architect to put them in perspective for himself; but, to give the general reader an idea of the effect of Mr. Kent's style, we shall place before him fig. 1386, which is a perspective view, by Mr. Kent, of the Paddington Charity School, built from one of his designs, with the exception of the porch, which was omitted on account of the expense.

1576. *Accommodation.* The ground plan, fig. 1385, shows, *a*, an enclosed yard, with three covered privies open in front, for the girls, and one ditto, with a door, for the mistress; *b*, a similar yard with privies for the boys, and for the master. The drainage from the yard, *e*, also all the water from the roof of the building, are carried through these privies; by which means, and by water laid on to the master and mistress's privy, they are kept clean and sweet. This will be more distinctly seen in the plan of the foundations. The roofs of the privies are flat, and covered with plain tiles, in cement. There is a small yard, *c*, for fuel, 8 feet by 8 feet 6 inches, to which access is obtained by the door from the yard, *a*, or through the kitchen door, *o*; *d*, is a small yard for fuel, to supply the boys' school; *e* is a yard for the girls to assemble in, the entrance being on the south side, *f*. This yard will be found useful in the summer time for the girls to go into in the afternoon, when the heat of the weather is found oppressive in their schoolroom, it being on the upper floor; *f*, entrance for the girls from the road or street; *g*, stone staircase leading into the girls' school; *h*, private staircase leading to the dwelling apartments for the master and mistress: under the two staircases, *g* and *h*, is a kitchen, 9 feet 6 inches square, with a cistern, sink, dresser, fireplace, &c., as shown in the plan of the foundations, fig. 1389; *i* is a committee-room, 21 feet by 13 feet; and, when not wanted for that use, the large folding doors, *r*, may be opened, and the room used as part of the boys' schoolroom, *k*. The boys' schoolroom, *k*, is 44 feet by 32 feet, and 11 feet 6 inches high; the windows are placed high, 6 feet from the floor, so as to leave the full use of the walls under them for desks, forms, and hats. The windows open up to the level of the ceiling, and are hung on pivots, thereby affording a thorough ventilation above the boys' heads: they are placed facing the south and north, in order that the extreme heat of the afternoon sun shall not be full upon them; there being abundance of light without the large window in the west front, should the heat from it be found oppressive; *l*, a yard for the boys to assemble in; *m*, entrance to the boys' school from the yard, *l*; *n*, gateway or entrance from the road or street, for the boys in the west front. These entrances are placed in the different fronts, to prevent, as much as possible, the boys and girls associating together, when they assemble morning and evening before the school hours. The yards enable the children to assemble in an enclosed space, thereby preventing them being a nuisance to the neighbours. The kitchen under the staircases, *g* and *h*, is lighted by the doorway and window, *o*. The closets, *p*, on the half space of the staircase, *h*, are for the use of the master and mistress. On a stone, *s*, on a brick trimmer (brick arch), is placed a stove, with a pipe through the floor above, into the upper or girls' school, to which it has been found to afford sufficient heat

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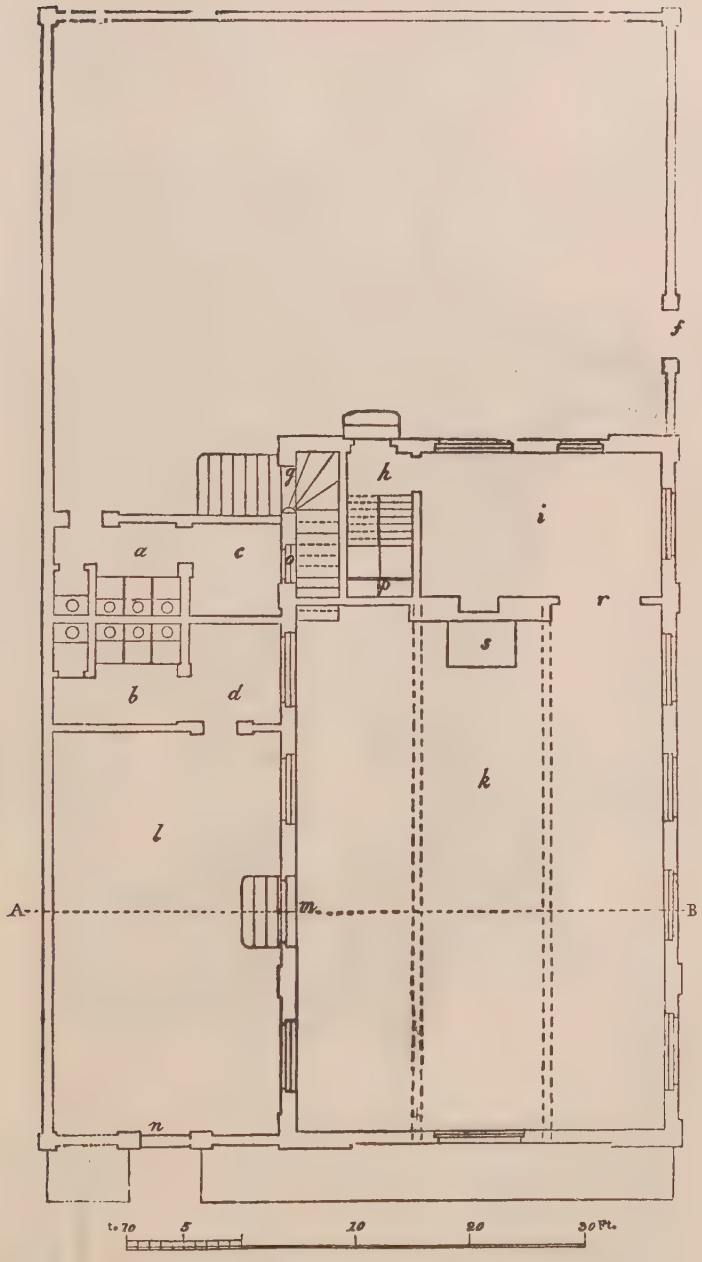
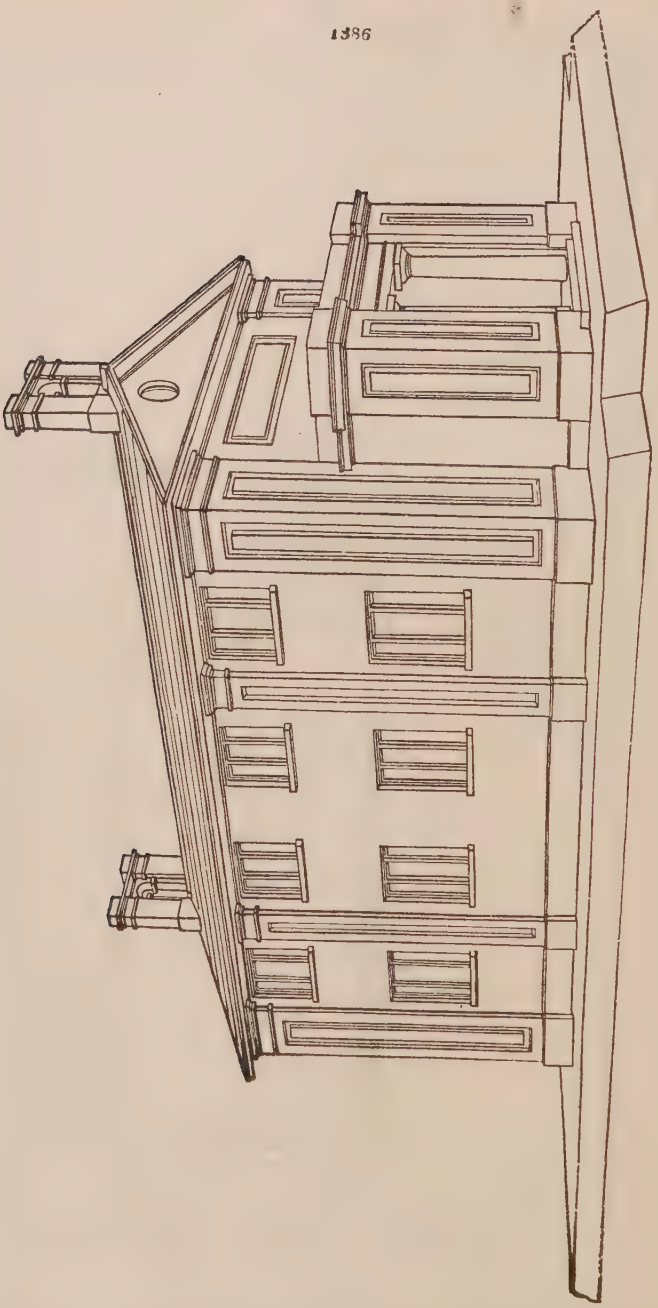


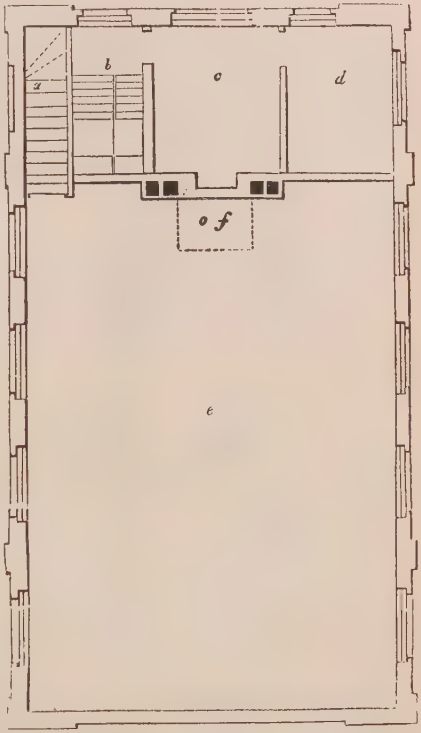
The upper floor, fig. 1387, shows a stone staircase, *a*, from the girls' school down to the yard, it should be formed of granite or Colalla stone (a quarry of sandstone, of great hardness, in Fifeshire), for the sake of durability; *b*, wooden staircase up to the bed-rooms

1386



for the master and mistress; *c*, sitting-room, 13 feet by 11 feet 6 inches, and 8 feet high, with a fireplace; *d*, bed-room, 13 feet by 9 feet 6 inches; *e*, upper or girls' school, 12 feet 6 inches high at the sides, and 18 feet high at the ridge, as shown in the section, fig. 1388; *f*, stove, with iron pipe from the stove in the lower or boys' school. The girl's schoolroom, in addition to the windows, is ventilated by circular lights filled with luffer-boards in the pediments; by which the heated air, that would otherwise accumulate among the rafters and other timbers of the roof, will be carried off.

1387



1577. *Construction.* In the plan of the foundations, fig. 1389, are seen, *a*, the drain built in cement to the girls' privy; *b*, the drain to the boys' privy; *c*, drain from the girls' yard, or play-ground; *d*, cesspool to the privies; *e*, drain from the boys' yard; *f*, drain from the foundations of the committee-room; *g*, drain from the sink in the underground kitchen; *h*, dresser and shelves in the kitchen; *i*, foundations for four cast-iron pillars to support the girders of the floor of the girls' school; and *k*, foundations for the sleepers. Fig. 1388 is a section on the line A B, in the ground plan, fig. 1386, in which are shown, *g g*, masses of concrete, 2 feet 6 inches deep, and 2 feet wider than the bottom of the footing, to be used where the foundation is of soft wet clay; *h*, cast-iron columns, 3 inches and a half in diameter, to support the girders and floor of the upper schoolroom; *i*, yard fence wall, a brick and a half or 13 inches and a half thick for 2 feet above the ground, and above that one brick or 9inches thick, with piers of the width of the lower part of the wall, at the distance of 8 feet centre from centre; *k* is the floor of the boys' schoolroom; *l*, the floor of the girls' schoolroom; and

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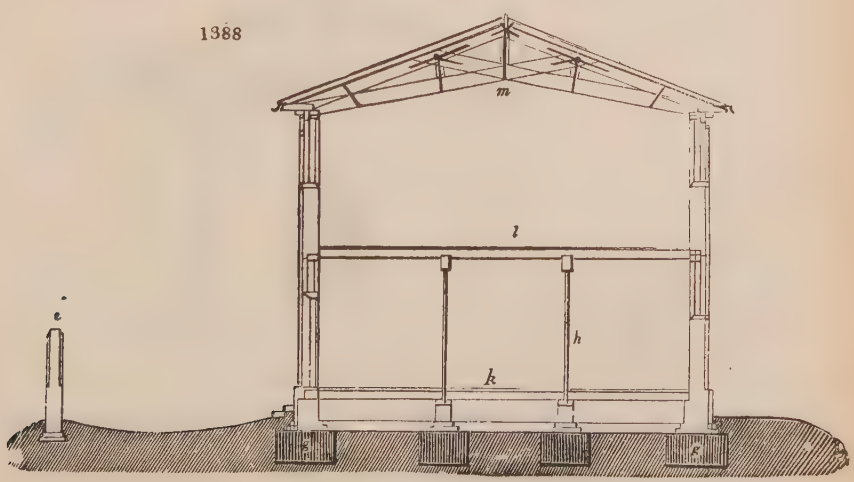

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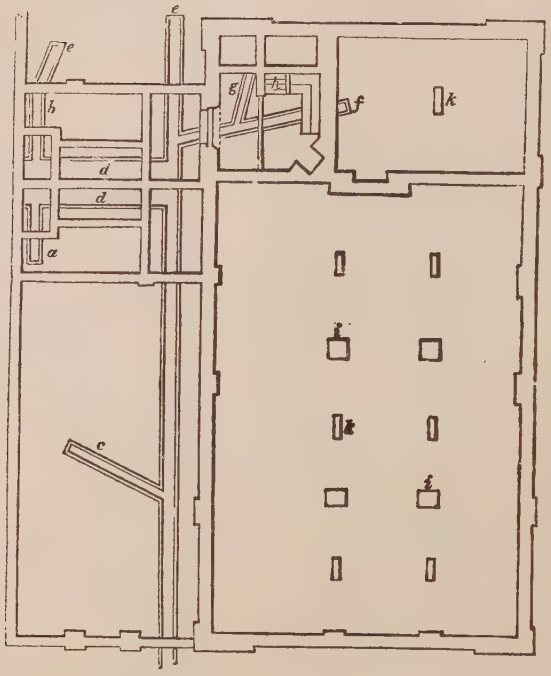

m, the appearance of the trussed rafters of the roof. Fig. 1390 is an elevation of the west front, showing in the tympanum (the space enclosed by the side and horizontal cornice,) the bull's eye (a circular opening) filled in with luffer-boarding for ventilation, and to

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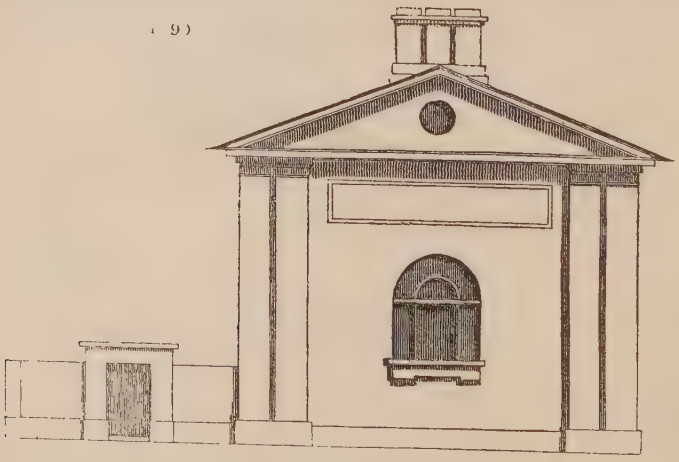

the left the door into the boys' assembling yard. Fig. 1391 is the south or exterior elevation of one side.

1578. *Specification* of sundry works to be done in erecting and completely finishing a charity school, including a residence for the master; for the committee of managers of

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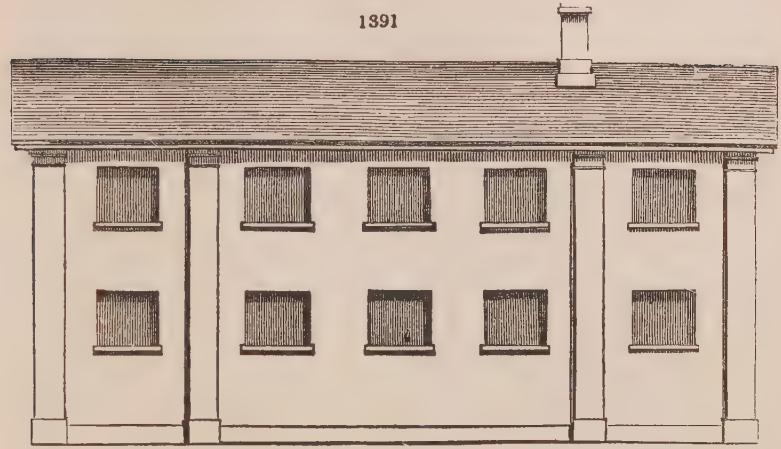


the charity school, in , conformably to the drawings made and to be made for that purpose, and agreeably to this description; and under the direction and to the satisfaction of the said committee or their surveyor.

1579. *The Contractor* to find all and every kind of material, labour, workmanship, scaffolding, carriage, &c., necessary, proper, and requisite for the due execution of all and every part of the works; and no alterations that may be made in any part thereof shall set aside the contract, but shall be added to or deducted from the contract, as the case may be; and the said additions or deductions shall be measured and valued, in proportion to £ per rod, for the best stock brickwork; per foot cube, for the best Memel fir timber, framed and fixed in the building; and per foot superficial, for 1½-inch deal, wrought both sides, and fixed.

1580. *The whole of the works* must be executed with the best materials of their respective kinds, and in the most substantial and workmanlike manner, and the rooms, &c., scoured and cleaned down, the chimneys cored (the sweep sent up them, to clear out pieces of mortar, &c., left in building), the windows cleaned, and the whole building left perfect and complete. The contractor to pay the district surveyor his fees, and all fees and expenses on entering the sewer (if within the operation of the Metropolitan Building Act, but not the expense of building the sewer), and fees for laying on water, &c.

1581. *Digger.* Dig, wheel away to a distance of fifty yards on an average, spread and level, as may be required, the ground from the whole surface to be covered by the school building, and yards for it and for the privies, the depth of 2 feet; and dig out and wheel away the ground for the footings to the several walls, privies, &c., of the buildings, and for the garden fence walls, privies, drains, and cesspools, and to an extra-depth for the kitchen, and for the foundation of steps, &c.; and cart away all ground not required to fill up the ditches, &c. Prepare, level, and ram the ground, provide and lay good gravel at least 6 inches thick, well beaten and rolled over the whole surface of both yards, with a fall for surface water as to be directed.

1582. *Slater.* Cover the roof of the building with strong duchess slates of the best quality, laid with 2 and a half lap, strong copper nails, and continued eaves (the first row of slates laid all along touching one another: in general the first row only breaks joint with the row over it).

1583. *Bricklayer.* Build the walls of the several dimensions and thicknesses, and with proper footings, as set forth and described in the plans, sections, &c., with good, sound, hard, well burnt, stock bricks and mortar, composed of well burnt fresh Dorking lime, and sharp dry seasoned road grit under ground, and with Thames sand to the parts above ground, mixed in the proportion of at least one part of lime to two parts of sand; and work all the walls above the ground on both sides in a neat flat joint, jointed, except to the committee-room and master's residence. Face the pilasters, arches, plinths, tablets, chimney-shaft, &c., with the best coloured second marl bricks, picked square, and cut and rub all the closers for the pilasters, &c.; face the whole of the remainder of the external work with the best coloured Cowley stock bricks, picked carefully for that purpose; but rub and set in putty all the gauged arches to the doors and windows with the best picked marl bricks. Properly bed all the bricks, rub them well

up full and flush in all the joints, and take care that no headers are executed with any but whole bricks, except where absolutely necessary to use half bricks. Turn brick trimmers in cement for all slabs, and turn arches over all the openings and the ends of all the girders. Bed all the door and window frames and sills in lime and hair, and point them all afterwards with cement; parget the flues with lime and brickdust cement. Build all half-brickwork at the back of the windows, &c., the three upper courses of the chimney-shafts, and the open drains under the privies in Parker's cement, and render ditto inside. Build the garden fence walls all round the ground (which is 105 feet net from east to west, and 50 feet net from north to south) of the same kind and description as is shown in the plan, fig. 1385, and in the section, fig. 1388, with one doorway complete (opening to the intended road), in the south fence wall, 10 feet from the south-east angle of the school building, of the same size as the one in the west garden wall in the west front. Provide and fix eight cast-iron air gratings, 9 inches by 6 inches, and splay off the brickwork for ditto, to give air to the foundation. Splay off all the reveals of the windows, &c., in the schoolrooms, and render ditto with cement. Splay off very neatly the angles of the piers to the openings to the yards for the privies, and to the opening for the stone staircase, &c. Render all the drains half round inside with cement, and also those inside the building half round on the top. Make good (join them) to the sewer in cement. Provide for three rods of reduced brickwork of the foregoing description to be used in the drains, walls, &c., not set forth in the drawings; and to provide for digging and carting the same, to be deducted if not required. Build a cesspool at the south end of the privies in cement, and render ditto in the inside and at the bottom with cement, size 2 feet 6 inches wide, and 7 feet long, and cover ditto with two 3-inch York stones, with two manholes in ditto, 15 inches in diameter (for cleaning out or examining the cesspools), and stones to fit the holes with strong iron rings let in for the convenience of raising them; and fix two 3-inch York stones across the cesspool let 4 inches into the sides, to form traps. Bed all the timbers that require it with lime and hair. Provide and fix proper iron chimney-bars to all the openings, 2 inches and a half by half an inch. Fix 3-inch York corbel-stones, to project 4 inches, for the ends, &c., of all the timbers, near the flues. Provide and fix twelve pieces of strong iron hoop worked into the fence walls at the angles, and turned up to keep on the brick on edge; lay four courses of the brickwork round all the walls of the building, and to the cross walls and to all the piers, in good Parker's cement, and grouted with cement. Build counter-arches under all the openings of the doorways, &c., under the ground floor.

1584. *Carpenter.* The whole of the timber to be good sound Riga or Memel fir; the deals good, sound, well seasoned, Christiania deals, or of equal quality; and the oak to be of English growth, free from knots and shakes. — Roof. Frame and fix a span roof, with four sets of principals, braces, struts, purlins, rafters, ridge-pieces, pole-plates, &c., all wrought undersides, and principal timbers chamfered, of the several scantlings set forth on the plans, &c. Fix blocks at the back of all the purlins and pole-plates on the principals, and on the bond, &c., well spiked. Fix on each side of the principals two long double wrought-iron strap irons (binding plates of iron), and to go over the top of the timber, 2 inches and a half by five eighths of an inch, and four ditto shorter, and to run down each side of the upper principals, 2 inches and a half by five eighths of an inch, secured with thirteen screw-bolts, washers, nuts, and screws, five eighths of an inch in diameter; and two strap irons, with strong washers, nuts, and screws, to the ends of the principals, 2 inches and a half by three quarters of an inch. Fix eight ¾-inch bolts, nuts, screws, &c., to the wall-plates at the angles, and four wrought-iron diagonal and dragon ties (straps to tie together the wall-plates at the external angles of the building) to the upper wall-plates, 3 inches by five eighths of an inch, turned down at both ends. Fix four angle ties to the pole-plate, 2 feet long each way, 1 inch and a half by half an inch. Fix eight bearing irons to the ends of the purlins, and four ditto to the ends of the pole-plates, 3 feet 6 inches long, inch by inch, turned up and down, to carry the rafters of the pediment. Fix a rounded roll for the lead on the ridge-piece, with strong irons every 4 feet. Provide and fix four long raking temporary braces from the wall-plates under the roof to the girders, bolted together where they pass. Cover the roof with ¾-inch yellow boarding for slates, edges shot (planed straight), and rough-planed, with tilters (tilting fillets). Lay on small joists, 4 inches by 2 inches, to the pediments; inch yellow deal for lead, with proper fillets, firrings (pieces of wood fixed on the joists under the boarding, thicker at one end than at the other, to give a current to the water), and rolls (pieces of wood rounded, to dress the edges of the lead over). Fix inch wrought and rabbeted fascia, 6 inches wide; and fix 1 inch and a half wrought and weathered fillet scribed (to scribe is to cut the edge of a board or fillet, so as to make it fit and touch every point of an irregular surface,) under the eaves of slates all round, and up the pediments; and to fix all round under the soffit a square fillet, 2 inches square. Frame and fix small ceiling joists, 3 inches and a half by 2 inches,

under the eaves of the roof and the pediments. Frame and fix pole-plates under the rafters, returned in the pediments; wall-plates throughout under principals and joists, &c., and fix templates under girders 3 feet long, 9 inches by 5 inches; the wall-plates and pole-plates, purlins, girders, and chain bond, to be in one length each, without laps. Frame and fix two floors of joists for girls' and boys' school, and three floors of joists for dwelling-rooms, &c., all carefully strutted and trimmed for flues, slab, staircases, &c.; and frame and fix ceiling joists for attics to the roof, and in the kitchen. Plane on three sides, and chamfer the edges of the two girders over the boys' school, and support the girders with four (3 inches and a half in diameter) cast-iron columns, with 1½-inch caps and bases, 6 inches and a half square, let into 6-inch York bases on piers. Frame and fix quarter partitions on the one pair and the two pair floors of the house, with heads and sills, principals, quarters, door-heads, puncheons, and horizontal braces, let in flush, &c. Provide and fix all necessary lintels, wood bricks, centring to apertures, templates, blocks, fillets, wedges, angle beads, &c., and feather-edge pieces to trimmers, and fillets, &c. generally, for plasterers. Provide and fix oak wrought octagon posts in the west front, 3 feet high out of ground, 6 inches in diameter, and large buts to ditto, 3 feet underground charred, and oak wrought arris rail framed into ditto, feet long, 4 inches by 4 inches, and dig and ram holes for ditto: the boards to be prepared and stacked (horsed) by the 1st of September.

1585. *Joiner.* Floors. Lay 1 inch and a half wrought yellow straight joint batten floors scribed to the brickwork, on the whole of ground floors, and in the girls' school-room. Lay inch deal straight joint floors on the one pair and two pair in the master's house, bordered to slabs. — Skirtings. Fix ¾-inch deal skirting, 4 inches and a half wide, blocked (small pieces of wood fixed at the back of the skirting, to keep it a little distant from the brickwork or the partition), to rooms on the two pair, and to all the closets, &c., on the two pair and one pair, and inch deal quirk ogee bead skirting, 7 inches wide, with narrow grounds and fillet, in the rooms of the one pair, staircases, and in the committee-room. Fix narrow grounds, and moulded chair rail, round the walls of the committee-room, 6 inches in girth. — Windows. Frame and fix in the window openings eighteen fir wrought and framed frames, 6 inches by 3 inches; muntins, 6 inches by 2 inches and a half; heads, 6 inches by 4 inches, lined outside with ¾-inch deal, scribed and splayed. Put oak wrought framed and weathered sills, 7 inches by 4 inches; 2-inch deal splayed bar sashes, the side sashes fixed, and the centre sash hung on hardened steel centres, with brass pivots, &c. Put proper beads inside and out, and patent lines, brass pulleys, and hooks, &c. Fix in the two pair, at the east end, a solid frame, sill, sashes, &c., hung as above, with circular head. Fix a large solid Venetian frame (a frame in three divisions, the two side divisions being narrower than the centre one), with sill, muntins, sashes, &c., with circular head, &c., at west end of boys' school. Fix in two openings in the one pair, and in one opening in the kitchen, deal-cased frames, oak sunk and weathered sills, 2-inch deal ovolo sashes, double hung, brass pulleys, patent lines, and iron weights. The Venetian window in the one pair sitting-room to be hung with lines and weights to the centre part, as above. Fix to the circular window in the two pair, to the upper part of the window in the bed-room, to the window in the kitchen, and to the window in the committee-room, inch deal staff beaded linings, and 1 inch and a quarter wide rounded deal window boards. Fix to the three other windows on the one pair, inch deal staff beaded and tongued linings, 1 inch and a quarter square framed window backs, and tongued cappings. Fix one brass patent sash fastening to each window. Fix on the roof over the staircase a 2-inch deal ovolo bar skylight, made to open with a quadrant fastening, hinges, &c. Fix 1 inch and a quarter wrought, beaded, and tongued linings, round the opening, and a narrow gutter at the back. Fix in the circular opening, or bull's-eye, at the west end, a fir wrought framed rabbeted and beaded circular frame, 4 inches by 4 inches; and fix in ditto eight tiers of 1¼-inch deal luffer-boards, wrought, splayed, and fixed on splayed fillets. Form a segment head for the plasterers in the committee-room to the window. Plane the face of the plate through the east window, and fix a ¾-inch deal soffit to ditto. — Doors. All the doors to be put together ready for wedging up by September 1st. Fix in the three openings on the two pair floor, the three openings on the one pair floor, and also in the two openings on the ground floor, 1 inch and a quarter double-rabbeted and double-beaded linings; those for the folding doors to be framed and moulded, with dovetailed rails for ditto, and inch framed grounds and moulding round on both sides, and hang seven 2-inch deal four-panel square-framed doors, with 3½-inch wrought butt hinges and screws; and fix one 7-inch brass knob best three-bolt lock on each door; and hang in the other doorway in the committee-room, 2-inch deal four-panel each flush folding doors, with three pair of 5-inch wrought butts. One 7-inch lock like the last mentioned, one 12-inch and one 3 feet ⅝ inch iron rod barrel bolt, with strong iron plates; and cover the doors with strong best green drugget on both sides, with gilt nails and tape, to form panels on ditto. Frame and fix to the entrance in the girls' school, 2-inch deal flush and square framing,

7 feet high, with four-panel square door to ditto, hung with 4-inch butts; and fix on ditto a 9-inch strong copper ward best drawback lock, and two keys; the style to framing next window to be turned flat against the wall, and to be 5 inches by 2 inches, rabbeted and spiked. Fix on the top $1\frac{1}{4}$-inch deal styles, and proper ledged flap, hung with 18-inch strong garnets and screws, and fastened with a strong hasp and staple. Scribe and fix $1\frac{1}{4}$-inch deal lining up to the sash frame and the glass. Frame and fix in the doorway to the boys' school a fir proper doorcase, 6 inches by 4 inches, let into the stone steps, the head 9 inches by 4 inches, moulded outside; and hang to the doorcase 2-inch deal four-panel three large beads flush and square folding doors, hung with three pair of strong 5-inch wrought-iron butts and screws. Fix a 10-inch solid brass knob drawback lock, with copper wards, and brass bolts, and two keys. Fix two $\frac{5}{8}$-inch iron rod bolts, 2 feet long, with strong iron plates. Fix scribed linings round the inside, and a moulding along the door head, and a solid sash frame, sill, and sashes over, hung; the whole to correspond with the other sashes, and to be framed. Fix a fir wrought framed rabbeted and double-beaded frame to the opening of the doorway to the house, 6 inches by 4 inches, with head 9 inches wide, weathered and moulded; and hang to ditto a 2-inch deal four-panel three large beads flush and square door, with 4-inch butts, one 9-inch brass knob best copper ward drawback lock, and two keys; two 10-inch brass knob strong barrel bolts. Fix over ditto a 2-inch deal square rabbeted fanlight frame, and metal fan, and glass; and inside, inch staff beaded lining and moulding over the door. — Closets. Frame and fix two $1\frac{1}{4}$-inch deal double closet fronts on the staircase, with square doors, two in width; the upper closet 7 feet high, with inch deal divisions, and shelves 18 inches wide, three in each closet, and inch deal rounded top to the upper one; inch deal floors and joists, bearers, &c.; $2\frac{1}{2}$-inch butts and screws, and 3-inch brass tumbler lock and key on each door (the tumbler of a lock is a piece of iron, or other metal, inside the lock, to make the bolt act truly and easily); prepare and fix, in the boys' and in the girls' school, a large closet for books, 3 feet by 1 foot 6 inches, and 7 feet high each, of $1\frac{1}{4}$-inch deal square framed front and door, and inch deal ends, wrought on both sides, and $\frac{3}{4}$-inch deal back, all wrought, ploughed, and tongued, &c.; four inch deal shelves in each, and top, and bearers, $2\frac{1}{2}$-inch iron butts, and 3-inch brass locks and keys to each. — Desks and Forms. Prepare and fix on each side of the girls' school and of the boys' school, $1\frac{1}{4}$-inch deal desks and forms, with legs and bearers to the forms and desks, 5 feet apart; a scribed fillet against the wall, and $1\frac{1}{2}$-inch beaded rail under the desks, and $\frac{3}{4}$-inch deal on each side of the forms, and holes for lead inkstands, and to supply them. Fix a form only, of a similar kind, all along the east end of the boys' school, and provide six loose unfixed forms of a similar kind, each 8 feet long, for the girls' school. Provide and fix in the girls' school two lengths of inch deal rail (3 inches wide), with iron pins 8 inches apart, all along over the desks. Provide and fix wrought iron on the edges of the desks, 1 inch and a quarter wide by one sixteenth of an inch thick, screwed on. — Staircase. Fix $1\frac{1}{4}$-inch deal, rounded treads, inch deal risers, and double carriage, with the steps properly housed into it, and the nosings returned, from the kitchen up to the two pair; $1\frac{1}{2}$-inch beaded wall strings and capping, ramped; $1\frac{1}{4}$-inch deal framed raking string, rabbeted, staff-beaded, cut, mitred, and sunk; turned deal newels, red oak moulded handrail, framed strong deal bar balusters, $1\frac{1}{4}$-inch deal rounded nosings, $\frac{3}{4}$-inch deal staff-beaded trimmer linings, gussets (the string board continued beyond the newel up to the ceiling in a triangular shape), &c.; proper $1\frac{1}{4}$-inch landings, carriage, &c. Fix inch deal boarding, ploughed tongued and beaded on both sides up to the ceiling of the ground floor, and down to the kitchen floor, to enclose the staircase. — Kitchen. Frame and fix $1\frac{1}{2}$-inch deal front, to enclose the staircase on the ground floor, with $1\frac{1}{2}$-inch deal 4 inch panel square door and hinges, and 7 inch lock, as to the other doors, with stops, &c. Fix a $1\frac{1}{2}$-inch deal dresser-top $\frac{3}{4}$-inch pot-board and bearers under, proper framed legs, rails, and runners (pieces of wood for the drawers to slide on, and to guide them), one drawer stock and two japan handles; inch framed end and backrail; two $1\frac{1}{4}$-inch deal sunk shelves, and cut standards, $\frac{3}{4}$-inch beaded fascia and top, and quirk ogee bead, and bead on the dresser to keep the plates from slipping. To put $1\frac{1}{2}$-inch chimney-shelf, with rounded corners, and two holdfasts; $1\frac{1}{2}$-inch deal, ploughed and tongued, with dovetailed cistern rims and bottom, and flap; and linings, in the ceiling floor to get at ditto, carriage for ball-cock, casings for pipes, &c. — Privies. Frame and fix two fir plates under flat, 6 inches by 4 inches, wrought and beaded, and $1\frac{1}{2}$-inch square fillet on ditto, and under ditto $1\frac{1}{2}$ inch wrought and framed oak uprights 4 inches wide; and fix between the privies inch oak divisions, ploughed, tongued, and beaded, and ledged, with back boards, and $1\frac{1}{4}$-inch oak seats and bearers, with holes cut in ditto to six privies, and inch oak risers, ledged water boards and wide fillet; and fix in two privies $1\frac{1}{4}$-inch deal seats, risers and bearers, clamped and beaded flaps and frames, $\frac{3}{4}$-inch plain skirtings, two inch butts, cut holes in seats, and for cocks, water pipes, &c., and fix

in two doorways fir proper doorcases 4 inches by 4 inches let into the stone, and lintels over them, and hang two 1½-inch deal bead butt and square doors, with 3½-inch butts, two 4½-inch best brass-bushed dead locks (iron locks with brass linings to the keyholes) and keys, two 4-inch strong bolts. — Yards. Fix in two openings in the fence walls fir proper doorcases, 6 inches by 4 inches, with heads 2 feet longer than the openings, the posts let in 2 inches into the stone sills; and hang to ditto 2-inch deal two large reed flush and square two folding doors, 2 panels, each with three pair of 4-inch wrought butts and screws to each pair; three 3 feet 10 inch strong rough rod-bolts, plates, and staples, and one strong wrought-iron latch to each doorway. Fix two strong stud posts and iron catches to keep the gates open.

1586. *Mason.* Fix sixteen Bath stone moulded caps on piers 3 feet 3 inches long, 10 inches by 6 inches each, and sixteen Bath stone neckings (members which are always used on the top of a column or pilaster, in Tuscan and Roman Doric orders, under the cap), 2 feet 10 inches long, each 7 inches by 2 inches. Fix Portland stone sills to all the window openings and blanks, 6 inches longer than the openings, 8 inches by 4 inches in one stone, sunk, weathered, and throated, and cut away bond timber at back for ditto. The sill to the east and west window to be 10 inches by 6 inches. Fix two pieces of 4-inch York landing (an extra-sized stone laid down before doors, and in the landing-places of stairs) in the openings in the fence wall, 4 feet 9 inches long, 2 feet wide each, worked fair on both edges; and cut mortise holes (holes for the projecting ends of the wooden framework) for the doorcases round corners. Fix three rubbed York stone steps to the doorway into the boys' school, and three ditto to the doorway to the house; each in one stone and 9 inches longer than the openings, 13 inches by 7 inches each, neatly rabbeted, and back-jointed to the floor; the ends worked fair, and the corners of the bottom steps rounded; cut mortise holes, and let in scrapers 4 inches deep, run with lead. Fix six York steps rabbeted, 13 inches by 7 inches, 3 feet 9 inches long each to the yards for the privies, &c. Pave the yards for the privies, and all privies and coal-yards, with 3-inch York paving in straight courses. Provide two pieces of 3-inch York stone, 18 inches square, for the yards; and provide and fix five 8-inch iron bell air-traps. Fix on two entrance doorways in the fence walls 3-inch York coping, rubbed and throated to all the edges, 22 inches wide and 7 feet 7 inches long each, in two stones bedded in cement, and double cramped with strong copper cramps run with lead. Fix, for the staircase to the girls' school, Purbeck stone steps, rabbeted and let into the walls. The first five steps and the four upper steps 4 feet 2 inches long, and the other ten flyers (straight steps in contradistinction to winders) 4 feet 9 inches long; the four winders (diagonal steps for the corners) may be out of 4-inch York landings, with risers of the same; the ends to be securely pinned in with cement, the bottom step to be rounded, and set on brickwork, with cut holes for iron bars. Fix two 3-inch York slabs in boys' and girls' schools for stoves, 3 feet 9 inches by 3 feet each, bedded in cement, the edges rubbed fair. Fix three neat solid Portland chimney-pieces, to show as profile chimneys, with 1½-inch shelf, slab, and York hearths to each, in the two pair and one pair and committee-room; and fix 2-inch rubbed York mantel and jambs, 8 inches wide, in kitchen. Pave the kitchen all over with 2½-inch York paving laid on brickwork two courses high. Fix a 7-inch York sink in kitchen, as shown on plan, 2 feet wide, cut holes for pipes, and let in bell trap, and provide and let in one 8-inch iron bell air-trap, with brick shaft under ditto into drain, in cement. Provide and fix two 3-inch York stones in flues for pipes in boys' and girls' school, 14 inches by 9 inches, fitted so as to be removed when required, and let iron pipes through ditto, and make good and flanch off brickwork with cement across flue, to prevent the soot from falling. Fix two York sink-stones, and form shafts in cement from ditto, into drain in coal-yards.

1587. *Plasterer.* Properly stop and lime-white twice over the walls all round in boys' and girls' school, and the boarding rafters, and timbers of girls' school, the inside wall and roof of the privies. Lath, lay, and float, and set, and whiten the ceilings and partitions on both sides of all rooms, closets, staircase, &c., throughout the dwelling-house, and the ceiling of boys' school and committee-room, and the soffit outside round building, and render float and set the walls in all the rooms and closets and staircase, and stucco the committee-room. The laths to the ceiling in boys' school and committee-room, and outside soffits, to be done with lath and half-laths; and the walls, &c., in the rooms of the one pair of stairs, and the staircase, and committee-room, to be coloured drab. Cover the plinth neckings and upper part of chimney shaft with Parker's cement, jointed, coloured, and tinted as stone, with proper arises and throats, the tops weathered. Cover the tablets at the east end with Parker's cement, and work on ditto, in raised letters, the name of the present school, date of erection, &c. Cover the roof of the privies with three courses of plain tiles in cement rendered top and bottom with cement, and work plain cornices along both fronts, throated, and colour ditto, and form current for water, and fix two cement rain-water trunks to take water into the drains. Render inside of the open drain

under the privy seats, all round up to the oak seats, with cement. Point up neatly with cement, round all the floors in schoolrooms, and after all the tradesmen generally. Run circular beads and quirks to the windows in two pair, and in the committee-room, and to doorway of the master's entrance; cut all the quirks; render two coats behind all the skirting, and to all the chimney openings, and lath and lay two coats behind the skirtings to all the partitions. Render with cement behind the window backs in first floor, and render the face of the half-brickwork to the windows with cement, and black ditto. Render and float with Parker's cement all round the walls in the kitchen, 2 feet high, $1\frac{1}{4}$-inch thick, and colour ditto.

1588. *Smith.* Fix six wrought-iron bars, inch square, 3 feet long, on the steps to the girls' school, and strong iron brace, and handrail ramped 2 inches and a half by five eighths of an inch rounded. Fix four strong iron scrapers let 4 inches into steps; five $\frac{7}{8}$-inch square wrought-iron guard bars to the kitchen window, and top rail, 2 inches and a half by five eighths of an inch.

1589. *Plumber.* Fix step flashing (pieces of lead flashing let into the joints of the brickwork above one another) 9 inches wide, round chimney shaft, of 4-pound lead, and fix on the ridges milled lead, 5 pounds to the foot, 20 inches wide, dressed round the roll. Strong lead-headed nails every two feet on both sides. Fix milled lead round the skylight, 5 pounds to the foot, 14 inches wide, and gutter, 18 inches wide. Fix milled lead on the base of the pediment at both ends, 6 pounds to the foot, to turn up 4 inches, and flashing, 6 inches wide, 4 pounds to the foot, over ditto, fixed with holdfasts; put 20 dots (studs, or broad-headed tacks) to keep the lead down, line the cistern in the kitchen with lead, 7 pounds to the foot at the bottom, and 6 pounds to the foot on the sides. Lay on water from the main in the road with inch extra-strong pipe and joints to supply the cistern, with ferrol (ferrol, in plumbing, is a brass tube soldered to the lead pipe at one end, and then driven into the main water-pipe), ball-cock and ball, $1\frac{1}{4}$-inch waste pipe to the sink from the cistern, and $\frac{3}{4}$-inch service pipe from the cistern to supply the sink, with cock and boss, 3-inch brass grate and bell trap soldered in; 2-inch waste-pipe from the sink into the drain; and lay on a piece of inch pipe from the service-pipe to the branch to the two best privies, with cocks to turn on the seats.

1590. *Glaziers and Painters.* Glaze all the sashes, skylight, &c., with good picked thirds glass; paint all the sashes and frames, sills, doors and frames, privies, outside soffit and fascia, ironwork to steps, closets, skirtings, window-backs and linings, and other woodwork and walls, &c., of the committee-room four times in oil and good colour, but not the oak-boarding and seats in the privy. Cover all the ironwork to the roof, iron angle ties, &c., with boiled oil and lamp black, and paint them twice in oil-colour, black.

1591. *General Estimate.* The actual cost of this school was £1287; and, as it contains about 62,000 cubic feet, this gives 5*d.* per foot as the guess rate of such buildings in the vicinity of London.

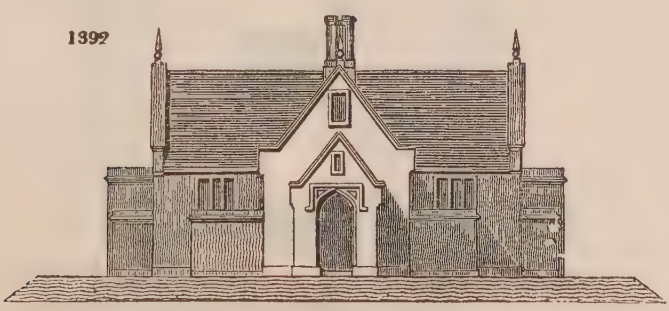
1592. *Remarks.* The specification of this Design appears remarkably complete; and it is the more likely to be so, because the contract was made from it, and it received its last corrections from Mr. Kent, after the work was executed. Having examined the school, we can answer for the excellence of the workmanship, and the completeness of the system of draining, heating, lighting, and ventilation. The system of underground drainage, as will be seen by reference to the foundation plan, is very complete; and the stone traps to the cesspools of the privies deserve the particular attention of builders: without them, all privies constructed and arranged so as to have currents of water passing through them, to wash away their contents, must necessarily smell; with them, all smell is effectually prevented; because, as the trap reaches down within 3 inches of the bottom of the drain, there will always be water more than sufficient to prevent air from entering by so small an opening. Many of the privies of the small houses in the suburbs of London are intolerable, solely from the want of traps of this sort; which, unfortunately, it would cost the occupant too much to build in; and the consequence, we have no doubt, is, that the stench gives rise to various diseases. We could have wished doors to all the privies without exception, for we do not like marking out a difference, even between children and their teachers, in any thing that relates to comfort or cleanliness: if a distinction is to be made, it should be in things which relate only to luxury and ornament. On mentioning the subject to Mr. Kent, however, he gave us a very sufficient reason for the omission. The mode of covering the privies with flat roofs, formed of three courses of flat tiles, laid in cement, is good, and of great strength and durability; more especially if, after laying the first coat, a week or more is allowed to elapse before the second is laid, and after laying the second, two months is allowed to elapse before laying the third. The mode of laying two courses of brick in cement, in the outside walls, and also in the cross walls and piers, immediately under the sleepers, ought always to be followed with every building

erected on soft moist soil; and so should the practice of forming foundations of concrete, and coating over the surface under the ground floor with the same material. The iron gratings in the walls, to admit of a thorough circulation of air, ought never to be omitted in similar cases; nor the excellent mode of ventilating the timbers of the roof. The principal cause of the durability of the roofs of churches, and, indeed, of all buildings erected above two centuries ago, is chiefly owing to the thorough ventilation given by leaving the eaves entirely open; a secondary cause may be, that, from the great abundance of oak timber all over Europe about that period, the builder could make choice of the very best: but, undoubtedly, the other is the principal cause. Providing yards for the children to assemble in, with sufficiently high walls to exclude them from the public road, so as to prevent them from being troublesome to the neighbourhood, is an excellent idea; and, from living at no great distance from this school, we can vouch for its success. Mr. Kent has suggested, that, in situations where the ground is dry and the drainage good, a basement story might be got, as an infant school; in which case the school-house would consist of three floors, and would be remarkably complete. The infant school is the pivot on which, in all countries, will turn the regeneration of mankind.

Design II. — *A Parochial School, on One Story, for* 100 *Boys and* 80 *Girls, including a Residence for the Master and Mistress.*

1593. *The object of giving this Design* is to show a parochial school of moderate size, duly proportioned for its uses in all its various parts, and rendered an agreeable architectural object externally. It has also been contributed to us by Mr. Kent, and bears all the marks of that gentleman's thorough acquaintance with the subject of schools, and his minute practical knowledge of Architecture and building. The general appearance of this school and dwelling-house is shown in the perspective view, fig. 1394. Fig. 1392

1392



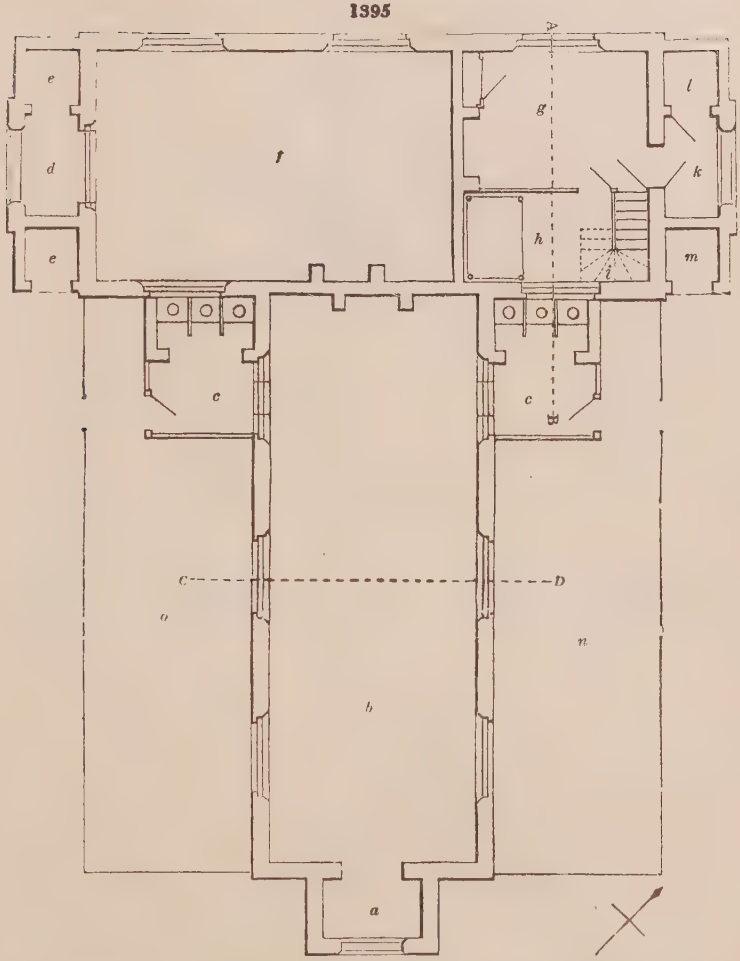
is an elevation of the south-east front, showing the entrance to the boys' school. Fig. 1393 is an elevation of the south-west front, with the entrance to the girls' school. The elevation of the north-east front is exactly the same as that of the south east front.

1393

1594. *Accommodation and Construction.* The ground plan, fig. 1395, shows a porch, *a*; a schoolroom for boys, *b*, 40 feet by 15 feet, 12 feet 6 inches high at the sides, and 16 feet in the centre, capable of containing 100 boys, allowing 6 feet superficial for each boy. This space Mr. Kent has found from experience to be sufficient, when the apartment is so proportioned as to throw the area into the most available shape; that is, when it is either 15 feet wide, in which case it will admit of one (Madras or Stoat's) class in

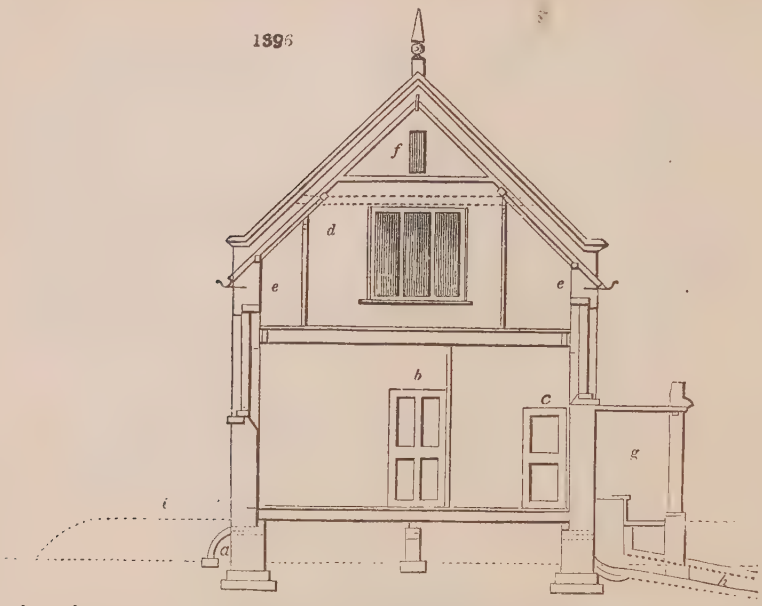
1394

1395



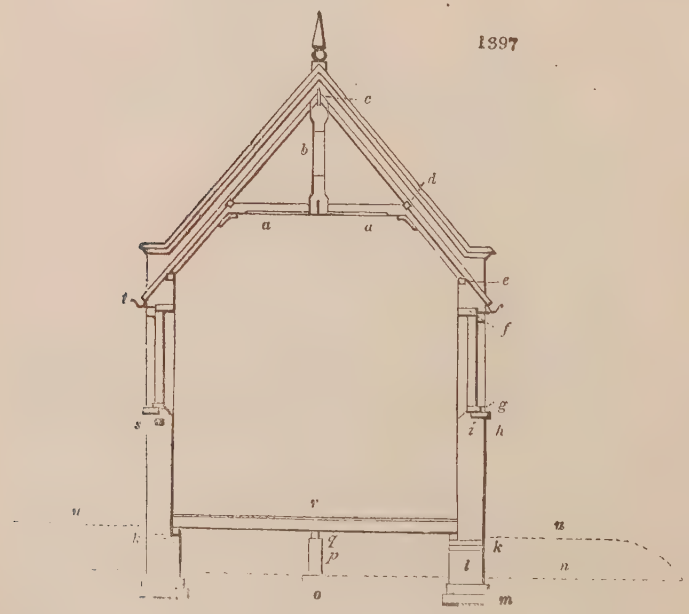
its width; or if it be 29 feet wide, when it will admit two classes. The windows are placed 5 feet 6 inches above the floor, to allow the space under them to be occupied by desks, forms, and a hat-rail. There are privies, *c c*, to each school; and, if thought advisable, a doorway may be made under the window of the boys' schoolroom, direct from that room into the yard where the boys' privies are placed; the same may be done with regard to the girls' school. There is a porch to the girls' school, *d*, which, like that to the boys' school, may be enclosed with doors; *e e* are places for fuel; *f*, girls' school, 26 feet by 16 feet 6 inches, 12 feet 6 inches high at the sides, and 16 feet in the centre, capable of containing 80 girls. The height of both rooms is obtained in the manner shown in section C D, fig. 1397. Both schools are to be ventilated by openings for air in the gables near the ridges, by which means a current of air will be always passing into and through the upper part of the roof; *g*, a sitting-room for the master and mistress, 13 feet by 10 inches, and 9 feet high, with a fireplace and closet; *h*, a small bed-room, 10 feet 6 inches by 6 feet 6 inches, and 9 feet high, with a closet under the staircase leading to a bed-room over *h* and *g*, 13 feet by 11 feet 6 inches, and 8 feet high: the sides are formed into closets, as shown on the section A B, fig. 1396; *k* is a porch to the master's dwelling; *l*, a larder; *m*, a place for fuel; *n*, boys' play-ground; and *o*, girls' play-ground. In fig. 1397, drawn to a scale of 10 feet to an inch, *a a* is the collar-beam which forms the ceiling to the boys' school-room; *b* is the king-post; *c*, the ridge-piece; *d*, the purlin;

1396



s, the wall-plate; *f*, the inside lintel of the window opening, the outside being a brick arch; *g*, two oak sill to the window-frame; *h*, the stone sill under it; *i*, the brick wall, 14

1397



inches thick; *k*, two courses of brick laid in cement, to prevent the moisture of the ground from ascending higher up the wall; *l*, wall under the sleepers of the flooring joists, 18 inches thick; *m*, lower footing, 2 feet 3 inches wide; *n*, level of the ground; *o*, footing, 10 inches wide, to the wall, *p*, 9 inches wide, which supports the sleeper, *q*.

This wall has also two courses laid in cement immediately under the sleeper. The joists *r*, are of oak, 6 inches deep; *s* shows the end of the chain bond, which is continued completely round the building at that height; *t* is the cast-iron eaves guttering, and *u*, the level of the platform. In fig. 1396, *a* is a dry drain to keep the damp from the platform off the foundation walls; *b*, the door into the master and mistress's living-room; *c*, the door to their bed-room; *e e*, two light closets off ditto; *f*, garret in the roof, lighted from the ends; *g*, privy; *h*, 9-inch drain to a liquid manure tank; and *i*, the surface of the platforms.

1595. *Specification.* — *Digger.* Dig out the ground over the whole surface to be covered by the building to the depth of 12 inches, also for the footing which must be 12 inches deeper, and proportionately deep for the drains and cesspools. The depth of these excavations must depend on the nature of the soil, which, if dry, need not be removed deeper than what is requisite to procure the necessary quantity of earth to form the terrace round the building; but, if the soil be of a damp or soft clayey nature, it should be taken out deeper for the footings of the walls, say 1 foot more; that is, 3 feet. The trenches for the footings should then be filled in with concrete (already described as a composition of clean gravel and hot lime mixed with water). The proportions are, one bushel of lime to five bushels of gravel; the whole to be well mixed and thrown in, then levelled, rammed, and beaten down every stratum of 9 inches in thickness. The whole surface under the floor should be covered with the same composition, and rammed 12 inches thick. If the drainage be good, this composition will form an excellent bed for a plaster or cement floor; but a deal, elm, or oak floor is better, being much drier and warmer for the children's feet. If the floor were formed of concrete or paved, a mass of stones under it might be heated by steam or flues, as shown § 20 and § 500; if boarded, a stove may be employed, as in Design I., or there may be two open fireplaces, as may be thought best. Cover the raised terrace with gravel, 6 feet wide, all round the building, 9 inches thick, well rammed and rolled.

1596. *Bricklayer.* Build the walls of the several heights and thicknesses, and with the footings as shown in the plans, &c. The walls at the south-east end of the boys' school, and at the south-west end of the girls' school, to be carried up in one brick thick from the level of the wall plates to the underside of the boarding of the roof, with holes in them, 6 inches square and 18 inches apart, for ventilation under the ridges. Build all the walls with a fair face on both sides, and strike the joints inside of the schoolrooms flush and fair for lime-whiting, as they are not intended to be plastered. Splay off all the reveals of the windows, and point up all the frames inside and outside with cement. Build two courses of all the walls, piers, &c., in cement, immediately under the sleepers, for the floors. Build brick piers for the sleepers, 6 feet 6 inches apart from centre to centre, each pier 9 inches square, 1 foot high, with two courses of footings, 14 inches square. Build 9-inch brick fenders for three fireplaces. Pave the fuel places and larder with stock bricks on edge. Build 200 feet of barrel drains (cylindrical in the section), 9 inches in diameter, and half a brick thick, all round the bottom of the privies, the lower half of the drains to be rendered with cement. Build a dry drain round the foundations, as shown in the section fig. 1396, two courses in one brick, and ten courses to form the arch in half a brick, in thickness. Cover roofs of the privies, places for fuel, larder, and porches to north-east and south-west fronts with three courses of plain tiles in cement. Cover the roofs of the building and the south-east porch with countess slating, nailed on with copper nails. To put on ornamental cement chimney-shafts, 6 feet high, with bases, and artificial stone ornaments on the top of the pediments, 4 feet 6 inches high, and 7 inches square, as shown in the drawings, fig. 1396, and fig. 1397.

1597. *Carpenter.* Frame and fix the roofs, with principal rafters, kingposts, and collars (chamfered on their edges) every 6 feet 6 inches, and purlins, common rafters, pole-plates, ridges, &c. Fix a wall-plate to serve as a lintel over the windows, and continue it all round, except where interfered with by the flues. Fix a chain-bond under the window-sills, continued all round in the same way, and extra-lintels over the upper windows in all the gables, to serve for bearing the ends of the purlins; cover the rafters with $\frac{3}{4}$-inch yellow deal boarding for slates, edge shot (planed on the edges), and planed in one side, with proper tilting and slab fillets. Fix ceiling joists for the bed-room, and floor joists, trimmed for the staircase and the chimney for the dwelling-rooms. Fix quarter ashlering (partitions framed in quartering for lath and plaster), to form the sides of the bed-room, and to enclose the staircase. Provide and fix all necessary centring for the windows, doorways, drains, &c. Fix $\frac{3}{4}$-inch yellow staff-beaded fascia and soffit round the roofs, 9 inches in girth, and cast-iron $4\frac{1}{2}$-inch semicylindrical troughs, supported by strong wrought-iron brackets. — Scantling of Timbers. Rafters, 4 inches and a half by 2 inches and a quarter; principals, 4 inches and a half by 3 inches and a half at top; ditto, 9 inches by 3 inches and a half in at bottom. Fir cut brackets, 14 inches long, 3 inches and a half by 3 inches and a half. Collars, 6 inches and a half by 3 inches and half; king-

posts, 8 inches by 3 inches and a half; purlins, 4 inches by 4 inches; pole-plates, 5 inches by 3 inches; ridges, 9 inches by 1 inch and a half, rounded for the lead; valley-pieces, 11 inches by 2 inches. — Partitions. Head and sill pieces, 4 inches by 3 inches; posts, 4 inches by 3 inches; quarters and braces, 4 inches by 2 inches and a half; wall-plates or lintels over the windows, 9 inches by 4 inches; wall-plates in the return-walls, 4 inches by 4 inches; chain-bond under the windows, 5 inches by 5 inches; common bond, 4 inches by 2 inches and a half; ceiling joists, 3 inches and a half by 2 inches; sleepers and floor-joists for sitting-room, &c., 6 inches by 2 inches; floor-joists for one pair, 8 inches by 2 inches, and all to be strutted; plates under the flooring joists, 4 inches by 4 inches; quartering for ashlering, 3 inches by 2 inches and a quarter; posts to ditto, 3 inches by 3 inches. The rafters to be planed on the under side, and all the other timbers of the roof on three sides.

1598. *Joiner.* Floors. Lay inch deal straight joint yellow deal floor, in the parlour and bed-rooms of the dwelling-house, with borders to slabs. Lay 1¼-inch yellow batten straight joint floors in both schoolrooms, on oak joists and sleepers, 4 inches by 3 inches; the sleepers, 6 feet 6 inches apart, laid on brick piers. Fix ¾-inch deal skirting, 6 inches and a half wide, round the dwelling-rooms and closets. — Windows. Prepare and fix thirteen solid proper frames of sound yellow fir; the sides and heads, 4 inches and a half by 3 inches and a half, chamfered on one edge, and rabbeted; the muntins to be 4 inches and a half by 2 inches and a half, chamfered on two edges, and double-rabbeted; the sills to be of oak, splayed and sunk, 5 inches by 3 inches and a half. Hang 2-inch deal ovolo bar sashes, 4 feet 6 inches by 1 foot 6 inches each, in five squares high, and two squares wide, with 3-inch butt hinges at bottom; with a chain, staple, and hook, to each centre sash, 12 inches long, so as to let them fall inwards to ventilate the room, and a 4-inch bolt to each. The windows to be glazed with second crown glass. The sashes to the dwelling-rooms to be hung on the sides. Fix 1-inch deal tongued and splayed and staff-beaded linings to three windows, and 1¼-inch rounded window-boards, 6 inches wide. Fix in each of the square openings in the gables, an inch deal board, chamfered at both ends, the size of the openings, with iron pivots at each end, to work in the lintel and sill, and a 4-inch bolt on each. — Doors. Hang 1¾-inch deal four-panel square doors, one in the upper bed-room, and four in the lower rooms and larder, with 3-inch butt hinges, and a good 3-bolt and 6-inch knob lock on each. Fix 1¼-inch single-rabbeted and rounded linings to the doorways, and 1-inch framed grounds, 3 inches wide, staff-beaded on edge round one side. Fix to the opening from the porch a fir proper doorcase, 4 inches by 4 inches, and an inch deal staff-beaded lining round inside. Hang in the ashlering of the bed-room, 3-inch deal two-panel square doors to the low closets at the eaves on each side of the room, 4 feet by 2 feet each, with 2½-inch butt hinges, and turn buckle latch to each; and fix 1¼-inch rabbeted and beaded linings for the doors. Fix 1¼-inch square framed spandril and door under the staircase, and up to the ceiling, and on the one pair. To enclose a closet from the lower bed-room, and put on hinges, and turn buckle. Fix fir proper doorcases to the boys' school and the girls' school, 4 inches by 4 inches and half; and hang 1¼-inch deal ploughed and tongued and ledged doors, with moulded fillets on the joints outside, with 24-inch fancy hinges, and a strong fancy iron latch of Chubb's patent (a latch invented by Mr. Chubb, of St. Paul's Churchyard, which cannot be picked), to answer the purpose of a lock. To fix a 1¼-inch deal framed and beaded closet front in the sitting-room, with square door, 2½-inch butt hinges, and closet lock. To fix 3-inch deal shelves in ditto, 16 inches wide. — Privies. Fix 1½-inch oak seats, risers, and bearers, and divisions, 2 feet 6 inches wide, and 6 feet 6 inches high each, all wrought, ploughed, tongued, and ledged. Fix two iron bars to support the brick-work over the opening of the cesspool, 7 feet 6 inches long, turned up and down at both ends, 3 inches deep, 1 inch thick, and 3 inches wide at the top. Fix 26 feet of oak cleft fence to enclose the yards of the privies, 6 feet 6 inches high, with three strong arris rails, cut out of stuff 4 inches by 4 inches, including two doors, each hung with 24-inch strong garnet hinges, and hung to fall to, and 6 feet oak posts, chamfered, 9 feet long, 6 inches by 6 inches, and spurs; and fix oak arris capping, cut out of stuff, 3 inches by 3 inches.

1599. *Mason.* Fix four plain solid Portland chimney-pieces, with chamfered edges; 1½-inch Portland slabs, and Yorkshire stone hearths. Lay three solid Yorkshire stone steps to the porches. Lay Yorkshire stone paving, 2 inches and a half thick, in the porches, privies, and in the yards to ditto, and to the outer doors to the fuel places; all the paving to be supported on bricks, so as to be hollow underneath. Fix Bath stone copings on the gables, moulded on the edges, 18 inches wide, and 4 inches thick, with copper cramps (iron is apt to stain the stone). Fix Bath stone plinths to both chimney-shafts, 2 feet high, grooved for lead flashings. Fix Bath stone moulded cornices, 9 inches wide, 3 inches thick, with a moulded front edge, and Bath stone ashlar (or blocking course) on ditto, 12 inches high to the two porches, and 9 inches high to the fuel places; 5 inches

wide at bottom, and 2 inches and a half wide at top; and fix stone round the three openings in the gables, and the same, 5 inches wide, round the opening in the east gable. Fix moulded Bath stone labels, 3 inches thick, over the two openings in the gables, and over the opening at the east end; and fix two trefoil-shaped plain sunk panels. Fix 13-inch York quarry sills, throated, 8 inches wide, and rubbed on the front edge, 3 inches and a half thick.

1600. *Plumber.* Fix ridges and valleys, 16 inches wide, 5 pounds to the foot, with lead-headed nails, &c. Fix step flashings, 9 inches wide, 4 pounds to the foot, to both of the chimney-shafts. Fix four stacks of 3-inch iron water-pipes, 15 feet long each; four ditto, 10 feet long each; two ditto, 9 feet long each; and ten shoes; all to be fixed in the drains with cement. Fix six heads to the pipes.

1601. *Plasterer.* Lath, lay, set, and whiten the ceilings and partitions of the three dwelling-rooms, staircase, and closet, &c.; and render, set, and whiten the walls. Stop, smooth, and colour twice over the whole of the walls, rafters, timbers, boarding, &c., in the two schoolrooms, and privies, and larder; and colour twice over the whole of the exterior brickwork, and the inside of the porches and fuel-places; and splash ditto with colours, to imitate granite or porphyry stone (see § 542), carefully protecting the stonework from being discoloured while the work is going on.

1602. *Painter.* Paint the woodwork usually painted in the dwelling-house, and the inside and outside of all the doors, windows, &c., four times in oil, of oak colour; and paint the fillets, hinges, and other ironwork, in imitation of green bronze.

1603. *General Estimate.* This school, if built in the neighbourhood of London, Mr. Kent informs us, will cost from £700 to £800. It contains 25,649 cubic feet; which gives about $6\frac{1}{2}d.$ per foot, as the guess price for buildings of this description in or near the metropolis.

1604. *Remarks.* Our readers, we think, will agree with us in considering this an excellent model for a parochial school of the simplest description, where there is neither an infants' school, nor a room for lectures or discussion. In point of architectural style, the effect is good; and the care with which the skeleton specification, as it may be called, is drawn up, will form a useful study for the young Architect; and, with the specification of the preceding Design, may supply some valuable hints to the many benevolent persons who are now, in all parts of the country, erecting schools for mutual instruction on the Bell or Lancasterian system.

Design III.—*A Country School, in the Italian Style, including a Dwelling for the Master and Mistress.*

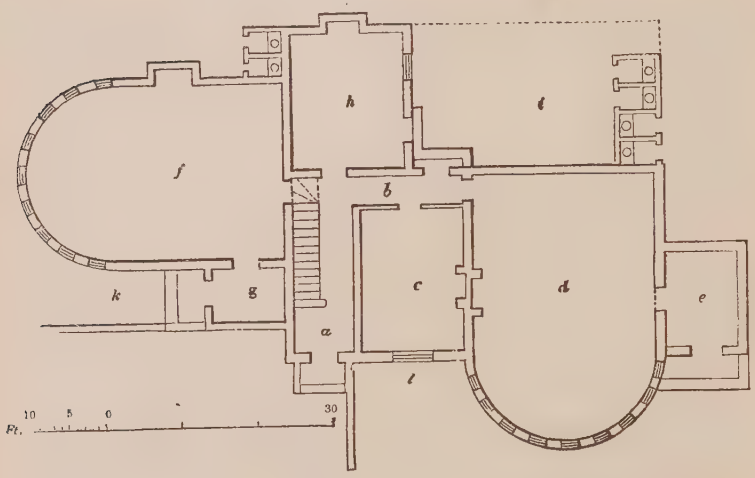
1605. *Accommodation.* The general appearance is shown in fig. 1398, and the ground plan in fig. 1399. In the latter, *a* is the entrance of the master's house, and to the

1398

infant school; *b* is a passage for the use of the master and mistress, by which the three schools are connected; *c* is the infant school; *d* is the girls' school, and *e* its entrance porch; *f* is the boys' school, and *g* its entrance porch; *h* is the parlour of the master and mistress, with a kitchen under it; and bed-rooms over both it and the infants' school; *i* is a yard to the infant school; *k*, a yard to the boys' school; and *l*, a yard to the girls' school.

1606. *Remarks.* We are indebted for this Design to Mr. Lamb, to whose taste in composing Italian elevations it does great credit. As in country situations it is seldom that so many infants can attend a public school as is the case in towns, the room for the infant school in this Design is much smaller than those for the boys and girls, and neither a gallery nor a class-room is considered necessary. With respect to the architectural style of this Design, the genius of the Italian manner is finely kept up by the masses of unpierced wall in some places, and the groups of openings in others; thus producing strong contrasts both in construction and in effect.

1399



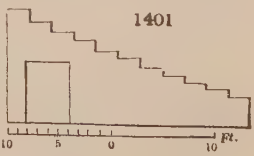
SECT. III. *Of the Finishing, Fittings-up, Fixtures, and Furniture of Parochial Schools.*

1607. *The Finishing of both the Exterior and the Interior of Schoolrooms* ought to be simple and substantial, as being less liable to be injured by the children; and because, when children are brought up in the midst of simplicity and plainness, they are rendered more independent in after-life. The interior surface of the walls should be built so smooth as not to require plastering; or, if plastering becomes requisite, the plastered surface ought to be lined out so as to indicate brick or stone; in other words, so as to give the expression of the simplest description of wall. Instead of lime-whiting such walls once a year, we would wash them over with alkali (pot or pearl ashes) or lime water; which, while it did not obliterate the forms of the stones or bricks, would, equally with lime-whiting, contribute to the purification of the air. The lower parts of the walls all round the schoolroom should be wainscoted, or lined with boards, to the height of six feet; not only for warmth to the backs of the children when seated against them, but to preserve their clothes, and the hats of the boys, from the lime of the wall. Instead of a plastered or bordered ceiling, it is preferable to leave the space from the floor to the roof perfectly open, because ceilings are found to reverberate the sound. The timbers of the roof may be occasionally oiled; but, as a matter of taste, we certainly should neither whitewash them nor paint them, because we would not destroy the genuine expression of strength produced by the real veins of wood. Where iron is substituted for wood, painting, of course, is unavoidable.

1608. *The Fittings-up and Fixtures* of schools depend on the age of the children, and on the system of instruction according to which they are to be taught. The fittings-up of an infant school differ from those of a school for children of a greater age, in having the seats from nine inches to a foot high, instead of sixteen or eighteen inches high. The hat pins are also proportionately lower, and are generally about three feet from the ground; while those in other schools are five feet. A form or seat for an infant school, when fixed, and with a back, should not be more than nine inches wide, in order to keep the children upright; and, for the same reason, there ought to be a bead along the floor, about six inches from the front line of the seat, for the infants to place their heels against, to aid them in keeping themselves up. Fig. 1400 is a section of the wall seats in the infant school in Baldwin's Gardens, in which *a* is the bead; *b*, the seat; and *c*, a row of pins for hanging the lessons on, and also their hats. The stage or gallery peculiar to infant schools and its proportions have been already mentioned, § 1521. Fig. 1401 is a section of the gallery in the infant school in Baldwin's Gardens, and fig. 1402 is a front

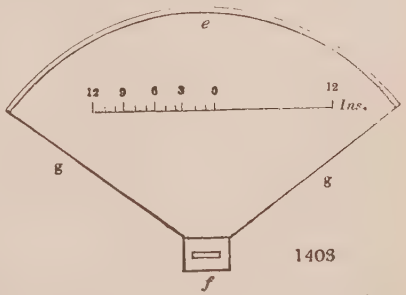
1400

1401



elevation of the same; in which may be observed the inclined plane which passes up the middle, and by which the children ascend and descend to their seats. In some cases, for this inclined plane is substituted a stair, with very low steps, which is, perhaps, safer for the infants, being less liable to cause them to slide. The lesson station is a fixture, which the infant school has in common with the others. It is the segment of a circle, generally formed of a brass hoop, let edgewise into the floor, with a socket in the point to which it is concentric, for holding a pole or rod, from which a lesson is suspended. Fig. 1403 represents one of the lesson stations in Baldwin's Gardens, in which *e* is an arc or segment, the size of which is three feet two inches and a half, for six infants to stand round, with their toes touching the bright edge of the brass hoop, and looking towards a lesson, suspended by a rod fixed to a socket, four inches by three inches, at *f*; *g g* are two brass lines, twenty inches long, to connect the segment with its central point, and to aid in guiding the eyes of the infants to the lesson suspended at *f*.

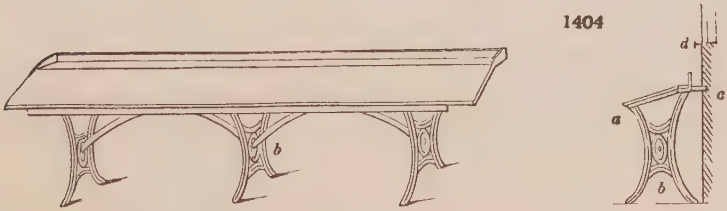
1402



1403

1609. *The Fittings-up and Fixtures of a School on the Madras System* consist of little more than the hat and lesson pins, and the writing-desks which surround the walls. The latter are about the same dimensions in height as those given for the Lancasterian schools, § 1541. Fig. 1404 is a view of one of the desks in the Madras School, at Baldwin's Gardens; of which *a* is a cross section, or end view,

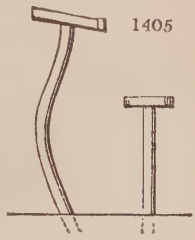
1404



showing the cast-iron supports, *b*, and the plugs, *c*, by which the upper part is fixed to the walls; *d* is the row of pins for hats, slates, lesson-boards, &c.; every boy being allowed two pins for these purposes. In some schools the pins are in two rows on different levels. The efficiency, and even beauty, of the cast-iron supports are worthy of notice.

1610. *The Fittings-up and Fixtures required for Stoat's Circulating System of Instruction* consist chiefly of single circles of sixteen feet in diameter, or of a circle of this diameter, with three concentric circles within it, marked on the floor by grooves, into which brass hoops are fitted; or which are filled with iron cement, or other composition, so as to form distinct lines for the children to stand round. Along the walls of the schoolroom are desks and benches, with two rows of pins fixed over them into the wainscoting, the same as described for the Madras system, from which Mr. Stoat's differs only in adopting the circulating mode of teaching, instead of the square or fixed one.

1405



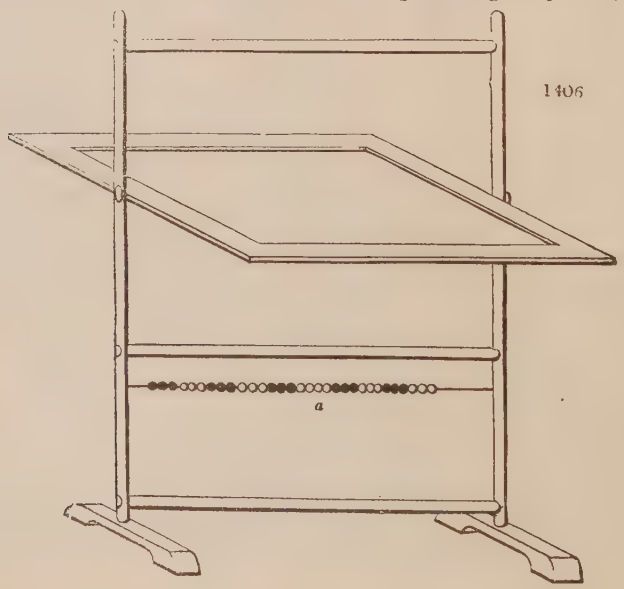
1611. *The Fittings-up and Fixtures of Lancasterian Schools* have already been given at such length, § 1540 to § 1545, that little remains to be said of them, except to give a section of the desks and seats, fig. 1405, the dimensions of which have been already stated, § 1559. Hat pegs, and pegs for pointers, lessons, &c., are fixed against the wainscoting round the room, in the manner already described, § 1535. (See plate II. of the *Manual of the System of Primary Instruction, &c.*) The semicircles, according to the Lancasterian method, are marked in the

floor by a groove filled with black putty, or by brass studs driven into the floor, in the exact position of each child.

1612. *The Fittings-up and Fixtures for the Parochial Schools in the Country*, where some of the children may have to come a considerable distance, and, of course, usually bring their dinners with them, should include cupboards for holding these dinners till the children are ready to eat them. In such cases, there should also be glasses, or mugs, and other articles, for the use of the children. The shelves in the cupboards should be of sufficient height to admit of a common corked bottle standing upright; a bottle of milk generally forming the liquid part of a country boy's dinner, at least in the agricultural districts.

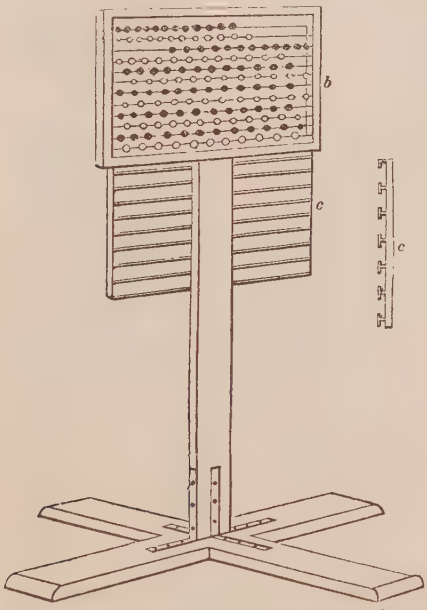
1613. *The Furniture of Schoolrooms* depends chiefly on the number of subjects taught in them; and on these we shall make some observations in a succeeding paragraph. As the schools of Britain are at present arranged, the greatest variety of portable articles are required for the infant school; and of these we shall briefly enumerate the chief. It may be premised, that the great object, in an infant school, is, to keep alive the attention of the infants; for which purpose the founder of these schools, Mr. Wilderspin, proposes no particular limits to the mode of teaching, or the furniture, or other means of carrying on the business of the school. He admits of every description of innocent amusement, of musical instruments, models, pictures, games, experiments, fire and water works: in short, of every harmless contrivance which may prove conducive to his grand object; viz., that of keeping alive the attention of the little creatures committed to his care. This latitude is one of the most remarkable features in Mr. Wilderspin's system, and one altogether worthy of the present age. Hitherto, when any system has been laid down, it has been assumed by its authors to be perfect, and therefore absolute; but the infant school system, and also that of Mr. Lancaster, contain in themselves, like the constitution of the United States of North America, the seeds of regeneration and perpetual improvement. As a proof of what is to be effected by genius and comprehensive views in the conduct of the education of youth, without reference to any preceding system, we may mention the Hazlewood school near Birmingham, and the Academic Institution at Hanwell, near London, founded by . Morgan, Esq., the celebrated author of the *Revolt of the Bees*, &c. Both are admirably conducted; and, in both, the business of teaching, and that of being taught, are converted into matters of recreation, rather than considered as tasks. For the *beau idéal* of a school for universal instruction, we may refer to our own tract, *Des Etablissemens*, &c., mentioned § 1573 and to *A Plan of Universal Education*, by William Freund, Esq.

1614. *For the Furniture of Infant Schools*, we have examined two at Westminster, two at Chelsea, one in Bishopsgate Street, and one in Baldwin's Gardens; and the principal portable articles which we have observed in them are the following: fig. 1406 is a frame on castors, containing a slate or black board for showing letters, figures, pictures, or other

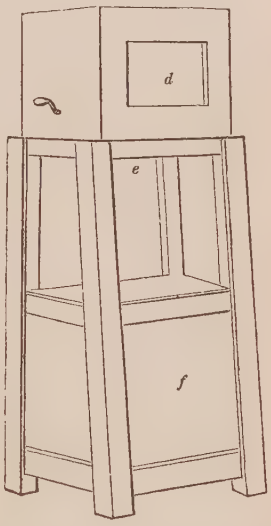


objects. This frame moves on two pivots, so as to admit of presenting its surface at right angles to the eyes of the infants, whether these may be standing or sitting on the benches round the walls of the room, or sitting or standing in the gallery. Below this board is a wire, *a*, on which are strung black and white beads to teach notation, and numeration. There is besides, an alphabet frame, containing shelves or compartments, each of which holds twenty-six letters. These letters are painted on small square tablets, which are put into the shelves by one or more at a time, according as the object of the master is to teach single letters or syllables, printed or written letters, small or capital letters, letters in the old English style, &c. When the lesson is to be proved, all the letters are put in, and the infants are directed to take them out by name. Fig. 1407 is a portable stand, combining an arithmetical board, *b*, for teaching the first four rules of arithmetic by different-coloured beads, with an alphabetical board, for teaching letters and syllables at *c*, a section of which is shown on a larger scale at *c'*. Fig. 1408 may be called the

1407



1408

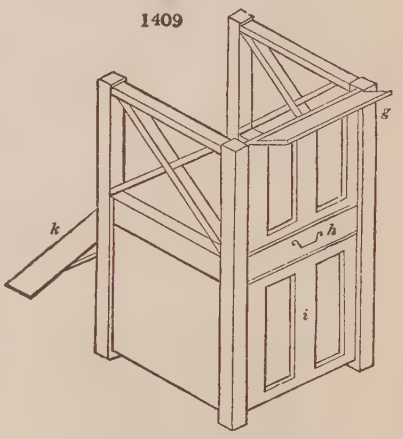


infant's show-box, as the upper part contains two rollers, on which there is an endless sheet with a great variety of pictures and names painted, and which, by turning one of the rollers, are shown at the opening, *d*. This may seem a very trifling and useless contrivance to some; but we are assured, and we can easily conceive it, that it is a source of great entertainment to the infants; and, as the objects shown include many articles in general use, and many of the leading objects in natural history; also the names of eminent persons, and of countries, on each of which, as the roller brings them to view, the master delivers a short lecture, it must be very instructive. Below this show-box is an open space, *e*, into which a variety of objects are introduced, at the pleasure of the master; the space being closed by a piece of pasteboard while the lecture on the show-box is going forward. A circular plate containing a mariner's compass on one side, and the dial of a clock on the reverse, is a common resource; and often square frames of pasteboard containing pictures are put in, and lectures delivered, or questions asked. The lower part of this stand, *f*, is formed into a box for books. Fig. 1409 is a rostrum or pulpit for a little monitor, with a reading-desk, *g*; a drawer, *h*; and a box for books, *i*; *k* shows the steps of ascent. Fig. 1410 is a rostrum of the commonest kind. Besides these, there are various other portable articles belonging to infant schools, which will be found figured and described in the works of Wilderspin, and other writers on the subject.

1615. *The Portable Furniture of a Madras School* consists of little more than forms, fig. 1379, and square boxes for books, which are shown in fig. 1378 at *o*. These forms are supported by cast-iron feet, in the same manner as the desks, as shown by the section

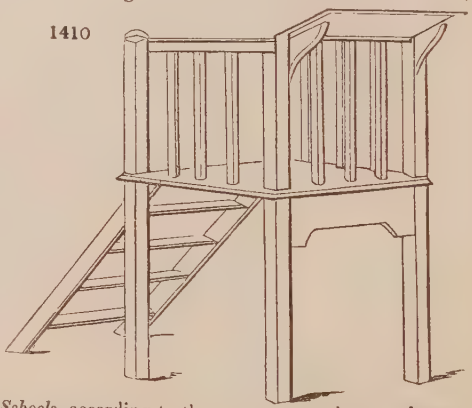
or end view, fig. 1404, *a*. The boxes for books are of deal, two feet and a half long eighteen inches wide, and eighteen inches high. In the girls' school, the boxes are made larger, with a division for work; or, there are two boxes to each class. The seat of the master, having a desk fixed before it, is portable in both the infant and Madras schools, and moves on castors, to enable the head master to station himself where he chooses; there is also a portable bookcase, or cupboard for books and other articles not in use.

1409



1616. *The Portable Articles of Furniture for a School on Stoat's Circulating System* are still fewer than those required in the Madras system. In Mr. Stoat's concentric circles there is no room for boxes, and the books are therefore kept in cupboards, either fixed or portable, placed against the walls, or in any convenient situation. The only essential portable article in Mr. Stoat's system is the medal-stand or point of reckoning, fig. 1411, unless we reckon among the articles of furniture the medals, lessons, slates, &c., common to all the four systems. This medal-stand is made of cast iron, or wood with a cast-iron base.

1410

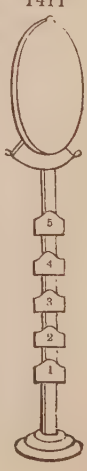


1617. *The Articles of Furniture necessary for a Lancasterian School* we have already enumerated at length, § 1543 to § 1558.

1618. *All the Furniture of Schools* according to the infant system may be obtained from Mr. Beilby, Chelsea; all those for the Madras system, from the central school, Baldwin's Gardens; all those for Stoat's system, from Mr. Stoat, Islington; and all those for the Lancasterian system from the Borough school.

1619. *Such are the Fittings-up, Fixtures, and Furniture of common Schools*, according to the present most improved practice in Britain; but, if general school education were carried to the point to which we think it ought to be, and to which we trust it will be at no distant period, every parochial school would contain most of the philosophical apparatus and models now almost exclusively to be found in colleges and universities; and, besides these, many of the implements, utensils, instruments, and machines necessary for the practice of the more useful arts. Our opinion is, that, when the social system comes to be better understood by the mass of society, and the greatest happiness of the greatest number is acknowledged to be the end of all government; education, like every thing else, will be comparatively equalised, and this high and equal degree of education will be acknowledged, by all governments founded on the universal will of the governed, to be as much the birthright of every individual as food or clothing. The kind and degree of education that we think ought to be given to every human being in this, and in every other country, and in every state of civilisation, may be thus defined: — All the knowledge and accomplishments that a child's body or mind, and the state of knowledge and the art of teaching at the time, will admit, previously to the age of puberty; giving preference to those branches of knowledge which may be considered the most useful, and those accomplishments and manners considered the most humanising, by the wise and good of the particular age and country. We consider this degree of cultivation to be as much the birthright of a child, in a highly civilised community, as food and clothes are in the rudest state of society.

1411



BOOK III.

DESIGNS FOR VILLAS WITH VARIOUS DEGREES OF ACCOMMODATION, AND IN DIFFERENT STYLES OF ARCHITECTURE.

1620. *A Villa* we intend, in this Book, to consider as a country residence, with land attached, a portion of which, surrounding the house, is laid out as pleasure-ground; or, in other words, with a view to recreation and enjoyment, more than profit. In this view of a villa, the dwelling is to be considered as only an amplification of the cottage; and the lands, as those of a farm, in which ornament and effect have been studied in the vicinity of the house. The humblest cottage, in our opinion, ought to contain all the essential comforts of a villa dwelling; and the lands of a farm, all that is useful in the grounds of a villa. The cottage and the farm are occupied as the means of obtaining and enjoying the comforts of life; and the villa of adding to these the gratifications resulting from the display of wealth and taste. In countries where all the inhabitants are in possession of equal rights, every industrious individual, not living in a town, will possess a cottage and a garden; and every man who has been successful in his pursuits, and has, by them, obtained pecuniary independence, may possess a villa. According to this view of the subject, it is not necessary that the dwelling of the villa should be large, or the land surrounding it extensive; the only essential requisites are, that the possessor should be a man of some wealth, and either possess taste himself, or have sense enough to call to his assistance the taste and judgment of others, who profess to practise this branch of the art of design.

1621. *The Art of arranging Villas in Britain* is far better understood than the construction of cottages, or the laying out of farms. The reason of this is, that the occupants of the two latter descriptions of residences have hitherto been deficient in that degree of cultivation which is necessary to the display of what is considered good taste; and have been too poor to be able to call in the assistance of the taste of professional men. The occupiers of villas, on the contrary, have not only possessed more cultivation and taste than the others, but, from their wealth, have been able to command the services of all who professed an ability to render them assistance. Hence it has followed, that the villas of Britain, though deficient in some particulars, are yet decidedly superior to those of every other country. It is easy to point out in them numerous faults; but where, in any other country, will be found half so many beauties in the Architecture and scenery, or so much real comfort and luxurious refinement in their accommodation and arrangements? In consequence of the comparatively improved state of Villa Architecture, this department of our work will require to be much less copious than those which have preceded it; and this the more especially, because there are already many excellent works which treat on the subject, under the titles of Designs for Villas, and Treatises on Landscape-Gardening.

1622. *The Principal Defect of English Villas* is in the want of a sufficient union between the house and the grounds; or, in other words, of cooperation between the Architect and the landscape-gardener in fixing on situations, and in laying them out. "Our parks may be beautiful," Laing Meason observes, "our mansions faultless in design; but nothing is more rare than to see the two properly connected. Let the Architect, by study and observation, qualify himself to include in his art the decorations round the immediate site of the intended building; and the improving taste of the gentry of England will second him in his efforts." Viewing the subject in the same light as Meason, we shall, in the present Book, first direct the attention of the reader to Fundamental Principles; next depict the *Beau Idéal* of an English Villa; afterwards, give Miscellaneous Designs for Villas, and Designs for Appendages to Villas; and, lastly, Designs for their Finishing, Fittings-up, Fixtures, and Furniture.

CHAP. I.

The Fundamental Principles of laying out a Villa, including the House and the Grounds.

1623. *The End in view, in forming a Villa,* is to produce a healthy, agreeable, and elegant country residence; and the means for attaining this end are, a judicious choice of situation, a fitting arrangement of the grounds, and a correspondent excellence in the interior accommodation and the external Architecture of the house. We shall take these three subjects in succession.

SECT. I. *Of the Choice of a Situation for a Villa Residence.*

1624. *In the Choice of the Situation for a Villa Residence,* two classes of circumstances require to be taken into consideration: the one includes such as are absolute or

permanent; and the other such as are accidental, or liable to vary from temporary causes. The permanent considerations include climate, elevation, surface, aspect, soil, water, and the sea; and the temporary or accidental circumstances are chiefly its locality, present state, prospective improvement, and the personal peculiarities of the intended possessor.

1625. *Climate* is, perhaps, the most important of the permanent circumstances which require to be kept in view in fixing on the situation of a villa; because it is less subject to human improvement than any other. In every country of any extent, the climate differs in different parts of it, and the popular divisions may be stated to be, the cold, the warm, and the moist. The last is unquestionably the least desirable; because it admits of least amendment by human means. The cold climate, provided it be dry, is often one of the healthiest; and it may always be improved by planting to afford shelter, and by increasing the dryness of the soil by draining. The warm climate, if it be dry, is always agreeable; and if the heat be intense during summer, it can be readily moderated by the shade of trees. A wet climate can scarcely be improved: it must necessarily be unhealthy compared with a dry one, on account of the moisture with which the atmosphere is always charged; and it precludes the exercise of the greatest of rural improvements, the surrounding the house with plantations. All other circumstances, therefore, being suitable, a dry warm climate must always be the best for a villa residence.

1626. *Elevation* is, in our opinion, the next most important circumstance to climate, though some may assign the second place to the character of the surface. The great advantage of elevation is, that it gives a command of prospect, without which a villa may be beautiful, picturesque, or romantic; but it never can be dignified or grand, and scarcely even elegant or graceful. The term elevation must always be considered as relative; and not to be determined by measurement. In a flat country, a knoll of 100 feet in height, by raising the ground floor of the house above the level of the tops of the highest trees in the surrounding plain, will allow the eye to range over an extensive distance; to catch a view, in all probability, of some river or stream; and, in a cultivated country, to command towns, villages, farms, and human dwellings. On the other hand, where the whole surface of a country is hilly, he that prefers elevation must fix on a hill somewhat higher than those by which it is surrounded, so as, at all events, to look over some of them. It is not necessary to dignity of effect and variety of prospect, that a house in a hilly country should enjoy such extensive views as a house in a plain; because, in the former case, the variations of the surface produce that expression in the landscape which in the flat country is unknown, and but faintly compensated for by the movement of the clouds, and other atmospherical changes. In every country, however, there is a limitation to the height at which it is desirable to build dwelling-houses; and this limitation is clearly determined by the growth of the principal timber trees of the country, indigenous or acclimatised, and the ripening of the hardy fruits. In other words, it is determined by the capacities of the situation for gardening. Whenever a situation is so high that trees will not attain sufficient dimensions to shelter the house, or fruit not ripen on the garden walls, it ought to be abandoned, unless a better one cannot be found.

1627. *The Character of the Surface* on which to build a villa is the next consideration, and is also one of great importance. A surface may be uniformly hilly, or irregularly so; and may consist of ridges and valleys, or of ridges on the sides of hills, rising above each other, without valleys. The variety, in short, is so great, that it can scarcely be classified with sufficient distinctness. It is hardly possible, however, to conceive a hilly surface in which excellent situations may not be found for setting down a villa. Perhaps one of the most desirable is, where a prominent knoll stands forward from a lengthened irregular ridge; and where the latter has a valley with a river in front, and higher hills rising one above another behind. One of the worst is, perhaps, the steep uniform side of a high hill, closely surrounded by other hills equally high and steep. On the whole, it may be observed, that though an irregular surface affords the greatest variety of excellent situations for building on, yet, at the same time, it is one in which the inexperienced are likely to commit the greatest errors; and one, also, respecting which it is more difficult to lay down general rules than any other.

1628. *Aspect* is next in the order of importance. There are some considerations respecting aspect which apply to every country; and others to particular countries, or districts of country only. Nothing in the Architecture or appendages of a house can compensate for its being set down on the north side of a high hill or ridge; where it is precluded from partaking of the direct influence of the sun during three or four months of the year. In most countries, there is some point of the compass from which rain and storms are more frequent than any other; and to set down a house in such a manner as to be exposed to these tempests is evidently injudicious. An aspect exposed to high

wind is less objectionable than one exposed to driving rains; since shelter may be afforded from the former by trees, but not from the latter by any means.

1629. *Soil and Subsoil* are very generally reckoned among the primary considerations in the choice of a site for a villa; and they are undoubtedly the first, as far as respects the value of the estate. But it must be recollected that the soil about a house can be totally changed by art, while the previously mentioned requisites of climate, elevation, surface, and aspect, hardly admit even of improvement. Where these circumstances are favourable, the nature of the soil and subsoil, though of secondary importance, have yet still considerable influence, both in regard to the health and enjoyment of the occupant, and the growth of the plantations. A soil which retains moisture on its surface, which is the case with most clays and loams with retentive bottoms, may be considered as the least healthy; and the one which admits of being walked on without wetting the feet the soonest after a shower of rain, is the most so. For the present purpose, it will be sufficient to consider all soils as either clayey, sandy, gravelly, or chalky; and all subsoils as either based on granite, argillaceous rock, sandstone, limestone, or chalk. Soils based on rocky subsoils, whatever may be the nature of the stone, may always be considered healthier than alluvial soils, sands, or gravels. Soils superincumbent on calcareous and sandstone rocks are found to produce healthier surfaces than those on chalk or slatestone; and surfaces, also, which are much better adapted for cultivation and the growth of trees. Unquestionably, the best substratum for the site of a house is a limestone or sandstone rock; and the worst, soft black peaty soil, or strong tenacious clay. But, in judging of the soil for a villa residence, regard must also be had to its suitableness for garden purposes, and for the growth of trees. In this respect the subsoil is sometimes of more importance than the soil: for the latter, in general, can be improved by draining; and its susceptibility of this improvement varies materially, according to the nature of its subsoil. The most difficult subsoils to underdrain are those composed of moist retentive clays; and, when to this subsoil is joined a flat surface, the situation, as far as respects the enjoyment of walking in the open air, is one of the most hopeless kind. A bad subsoil is an effectual barrier to the thriving of timber trees; and, as these constitute the finest ornaments of every country seat, the importance of choosing a subsoil either naturally congenial to them, or capable of being rendered so by art, is sufficiently obvious. In an economical point of view, it is always more desirable to choose a poor soil than a rich one, provided it be dry, for the immediate site of the house. Rich soils are better reserved for cultivation; and, indeed, for the purpose of lawns and kept grounds, they only serve to increase the expense of mowing and weeding, by the luxuriant growth of their herbage. On the whole, therefore, the most important consideration, in respect to the soil of the site of a villa, is, that it should be dry, and placed on a subsoil favourable to the growth of trees.

1630. *Water* is the remaining consideration; but it is one of very secondary importance. For all domestic purposes, it can be procured almost every where by boring or sinking wells; and pieces of artificial water, where expense is not an object, may be supplied by machinery from natural sources, at the distances even of miles. It is singular, that in England, where immense sums have been laid out on the grounds of villas, and where the steam-engine is familiar to every body, so little should have been done in the way of bringing water from a distance by underground pipes, and forcing it to higher levels by means of machinery. Some of the noblest parks, with the surface of the soil finely varied, and beautifully enriched with wood, lose half their effect, from the want of as much water as might be supplied from a distance by an engine of one-horse power, which might be kept up at a less expense than a footman or a groom.

1631. *The Situation of a Villa, relative to the Sea*, is a consideration that chiefly applies to islands, and countries bordered by the ocean; but in these it merits particular attention. Some of the differences between an inland and a maritime situation are of a permanent nature, and can never be affected by human improvement. Of these, some of the principal are, the dryness or moisture of the air, its moderate temperature, and the unfitness of most maritime situations for garden purposes. The uniformity of temperature on the sea-coast is a great recommendation to persons of particular constitutions; and so is the dryness of the air on the east coast of our island, and its moisture on the west coast. The grandeur and variety of a marine prospect at every season of the year are powerful considerations; and, to those who have little relish for gardening pursuits they may compensate for their absence. In choosing a marine situation, it is an important point to ascertain whether or not it will admit of the free growth of trees and the culture of garden productions. On the western shores of the British islands, especially when there are hills or mountains at no great distance in the interior, timber trees grow freely to the water's edge: on the eastern shores, on the contrary, they will scarcely grow at all.

1632. *Among the temporary Circumstances* which influence the choice of a situation

for a villa, are included, its locality, its present state, its prospective improvement, and the peculiarities of its possessor.

1633. *By Locality* is to be understood the distance from the capital of the country in which it is situated; from a smaller town or village; from a road or canal; from another villa; or from neighbours of any sort. The distance from a town, at which it is desirable to place a villa, must depend so much on the style of living, and the taste of the occupier, that it is scarcely requisite to say any thing on the subject. Where taste is free, however, the villa ought to be at such a distance from the town as to be decidedly a country-house; and, for the same reason, it does not appear desirable that the villa should command a view of the town, even in the extreme distance. This sentiment will be felt with more force by the citizen engaged in business, who goes to the town almost every day, than by the country gentleman or retired tradesman. In the first case, the associations recalled by the appearance of the town are those of toil and occupation; in the second case, they are those of society and gaiety. The circumstances of a neighbourhood materially affect the character of a villa. Hitherto the prevailing ideas in England have been in favour of exclusive enjoyment; and the great object, whether in small villas or extensive ones, has been, to shut out every thing belonging to the neighbourhood, which could indicate that there was any other proprietor or resident in the vicinity. The only objects that might be legitimately shown were, wood, pasture, water, rocks, ruins, and public buildings. In short, the end aimed at by this exclusive system was, to appropriate in idea the whole of the surrounding country. The extent to which this has been carried by the higher classes in England can scarcely be conceived by the proprietors of other countries; and is not at all understood by them. The possessors of extensive parks abhorred the appearance of a human habitation, however humble or however distant; and the first object of a new settler, of the rank of a gentleman, was, generally, to purchase every thing around him; and to seclude himself in a sort of artificial forest, for his own exclusive enjoyment and that of his friends. Happily, this antisocial spirit is beginning to give way before the general spread of intelligence, and, what is of more effect, the salutary influence of diminished wealth. Notwithstanding this, we consider it perfectly natural and in good taste, to plant out a number of objects which serve to recall the idea of a town, or of manufactories, and thus to diminish the idea of the country and of rural life.

1634. *The present State* of a property adapted for being formed into a villa residence involves a great variety of circumstances. It may be with trees and plantations, or without them; in aration, or under pasture; in a high state of improvement, or in a state of neglect. No man can determine for another which of these states is most desirable. To an intended purchaser who is desirous of avoiding trouble and uncertain expense, the less there is to do, the more immed ate will be his gratification. To another who understands the improvement of land, and who takes delight in it, the more there is to do, the greater will be his satisfaction in doing it. A young purchaser will generally prefer forming his own plantations; one who retires for quiet enjoyment, or because he considers it a mark of distinction to possess a villa, will give the preference to a situation where nearly every thing is ready prepared to his hand; and where he has little more to do than to take possession.

1635. *The prospective Improvement* of a villa residence is but a secondary consideration, where it has not the addition of an extensive landed estate; and hence it cannot have much to do with Architecture. Nevertheless, it ought not to be lost sight of; and, where two situations are equally desirable in other respects, that which is likely to be improved by the growing prosperity of the neighbourhood will be preferred by every reasonable man. The difference of situation, in this respect, is very considerable. Almost all inland towns, which are the seat of manufactures, are either in a state of progressive improvement, or on the decline. Hence the great change in the value of property in their neighbourhoods; and the consequent profit or loss on estates which derive their chief value from their local situation. Accidental circumstances, also, frequently increase or diminish the value of a villa residence as such. In general, whatever has a tendency to approximate the surrounding country to the character of a town, has the latter effect, however much it may add to the actual value of the land.

1636. *The peculiar Tastes or Circumstances of the intended Occupant of a Villa* often determine his choice of situation. A man engaged in business every day must have his villa within a certain distance of the place of his occupation; and another, not engaged in business, may prefer a spot with which he has some peculiar associations; such as, the parish in which he was born; property which once belonged to his ancestors; or the vicinity of some river for fishing, or of a fine country for sporting, &c.

1637. *All these Considerations, and a Variety of others*, require to be taken into view before fixing on the situation of a villa residence. It must be confessed, however, that, in a country like Britain, where by far the greater part of the landed property is in large

masses entailed on particular families, there has hitherto been very little room for choice. Commercial men, who, after having made fortunes by trade, have retired to the country to enjoy them, have had hitherto little opportunity afforded them of making a judicious choice, and have generally been obliged to set themselves down where they could. Hence the great number of villas which are to be found in dull, low, and damp situations, undistinguished by a single feature of external beauty. Hence, also, the little attention that has hitherto been paid to the situation of villas by Architects; so that, when an opportunity does occur of making a choice, they are not, in general, competent to take advantage of it. A new state of things, however, is gradually arising: in a few years landed property will be more equally distributed; its value will be diminished; and, in consequence of a greater number of possessors, there will be an increased demand for villas, and a consequent improvement in the taste of Villa Architects.

SECT. II. *Of the Position of the House, and the Arrangement of the Grounds of a Villa Residence.*

1638. *The Arrangement of the Grounds of a Villa Residence* includes the position of the house, relative to the natural features or accidental circumstances of the grounds; and the disposition of the offices, roads, gardens, farm, and other component parts of the whole.

1639. *The Position of the House* should, in every case, be pointed out by some striking natural feature; or, where no such natural feature exists, an approximation to one should be created by art. Whenever a house is so placed as to display no sufficient reason why it has been erected in that precise spot, rather than in any other, something must decidedly be wrong. There is no surface on which a house can be built, which may not be so managed as to create an artificial reason for making choice of the exact spot on which it stands. This is to be effected, first, and principally, by elevating the base or platform from which the structure appears to rise; and, secondly, by the disposition of the plantations by which it is connected with the surrounding scenery. On the dullest and flattest surfaces, by raising the house on a platform of twenty or thirty feet high, or more, according to the dimensions of the house; and by connecting this platform with the surrounding grounds and plantations, by gradations of terraces and shrubberies, the main body of the house will be raised higher than the highest of the surrounding trees; and this, by giving, at a distance, the same effect as though it were placed on a knoll, will afford at once a satisfactory reason to the stranger, why it was erected on that spot, in preference to any other. The space under the arches which support the platform may always be made use of as cellars or offices, and the surface over them can be laid out as Italian or terraced gardens. Even if only a part of the space under the platform were made use of, still the important effect produced would justify the means. In the case of a uniformly sloping bank or hillside, on which it is desired to create an artificial position for a house, the Architect should proceed in one of two ways, according to the nature of the ground. In a dry soil and subsoil, he may scoop out a recess, with the earth of which he may form two prominences on each side of it; and in an elevated position in the back part of the recess he may place the house, so high as to raise its main body considerably above the surrounding trees. When the two projecting points or prominences are properly planted, the house, at a distance, will appear to be placed in a natural recess on the side of the hill, backed and flanked by wood. When the soil and subsoil of such a bank are moist, a platform may be raised, projecting boldly forward, and a recess excavated behind; with the soil from which, terraces may be formed in front of the house, and at two of its sides; the space behind, and also the sides, being planted. The effect of this at a distance will be, to give the house the appearance of being built on a projecting point or promontory; which, from being the only one on the otherwise uniformly sloping bank, would appear clearly pointed out by that circumstance as the position for a house. These examples will be sufficient to give every Architect, who has studied the effect of scenery in the country, an idea of the mode of proceeding, to create artificial situations in the most hopeless cases.

1640. *When there are natural Indications of Features in the Grounds*, they may always be heightened by the foregoing means, as well as by others. A knoll, if too small, may be enlarged; a rock (a most desirable feature on which to found a house, when it can be obtained, but which is very rarely taken advantage of as it might be) may be increased in magnitude upwards, by additions; or downwards, by the removal of earth. The bend of a river may be widened, or the course of a stream may be changed: in either case, heightening the natural expression, and creating a most desirable site. Where a house is to be built on the margin of a lake with a tame uniform shore, the common practice is, to keep it a certain distance from the water, and to form a lawn between it and the house: but a bolder and more striking mode of proceeding would be, to carry the platform on which the house is placed to the very margin of the lake, and even projecting

into it; or to bring an estuary from the lake to the house; or to give it the effect of being placed on a promontory or a peninsula. Whatever mode is adopted, the platform on which the house stands should always be raised considerably above the level of the water, and the main body of the house above the tops of the highest trees; not only for the sake of effect, but for the health of the occupants.

1641. *When a striking natural Situation occurs*, it should not be rejected, because it may be on the boundary of the estate, unless there be something decidedly offensive in the adjoining property. Some of the noblest situations of villas, in Britain, are on the sea-shore, or on the steep rocky banks of rivers, or on lofty cliffs overhanging public roads. The proximity of the sea, of a river, or even of a public road, to a house, can never be offensive to the occupant; because, though they do not belong to him, they belong to no one else, and the grandeur of their effect overpowers every other consideration.

1642. *The accidental Circumstances which influence the Position of a House* are, chiefly, the boundary of the property, and the existing trees, roads, buildings, fences, and other artificial objects. The most desirable position for a house, all other circumstances being alike favourable, is the centre of the estate. The advantages of being at an equal distance from every part of the boundary; of having, as much as possible, on every side, that which we can call our own; of not being overlooked by near neighbours; and of reposing, as it were, in the bosom of our own tenantry, cottagers, cattle, woods, and gardens, are obvious, and felt by every one. It is seldom, however, that natural features correspond so exactly with accidental circumstances as to render this practicable; and, therefore, all that the Architect can do is, to make the nearest approach to such a combination that the case will admit of.

1643. *To be guided by existing Trees, Roads, or other artificial Objects*, in fixing on the position of a house, is obviously bad judgment; on the general principle, that what is intended to be permanent should never be made subservient to what is only temporary. Nevertheless, this is very frequently the case; and nothing is more common than to see good houses deprived of half their effect from being placed in some inferior situation, merely because it contained a few old trees, or was the site of a former mansion, the cellars of which, perhaps, remain; or because it was near very good offices, which it was thought a pity to pull down. Such are the shortsighted prejudices with which Architects have frequently to contend.

1644. *The Offices of a Villa* include those of the kitchen-court, those of the stable-yard, and those of the farm. In small villas, or in what may more properly be called villa farms, these may be all arranged around one court: but, in general, they are placed apart; the kitchen-court being attached to the house, the stable-yard adjoining the kitchen court, and the farm being placed at some distance, according to the situation and the kind of farm. The principle by which the position of both the kitchen and stable offices is determined is, that of having free access to them without coming in sight of any of the fronts of the house. This is, perhaps, one of the most important points in determining the position of a villa and its offices; for, if the latter are placed so as not to be accessible by servants and tradesmen without their passing the front of the house, it is scarcely possible to make a perfect villa. It is not necessary to the attainment of this object that the offices should be concealed: on the contrary, they should always be visible, and be rendered subordinate and supporting parts to the main body of the mansion, and should cooperate with it in forming a whole. In general, there is only one approach to a villa; and, in that case, the offices should always be on the side by which the approach road advances towards the entrance front. When there are two approaches, advancing towards the entrance front in opposite directions, then the offices ought to be placed on that side which is most likely to be the principal road for tradesmen and servants. This will, of course, generally, be the side which is next the nearest village or town. In scarcely any case that we can conceive is it desirable to have the kitchen-court on one side of the main body of the house, and the stable-court on the other, as wings; though this was formerly much the practice in large mansions. The inconveniences of such an arrangement for a villa are too obvious to require pointing out; and they could only be tolerated in times when the proprietors of such residences were surrounded by servants, and when the highest ambition of taste was ostentatious display.

1645. *The Farm Offices of a Villa* should always be placed on the side next the stable offices; so as that a free communication between them may take place, without interfering with the entrance front on one side, or the lawn front on the other. Where the farm is large, the offices should be central to it, whatever may be their distance from the house; but where it is small, and chiefly used for raising produce to be consumed at home, the farmery may be placed near the stable yard, and may compose a subordinate part of the general architectural group.

1646. *The Kitchen-garden* of a villa should always, if possible, be on the side next

the offices; not only that a free communication may take place between the kitchen and the garden, without interfering with either the entrance front or the lawn front; but that the stable dung may be taken to the garden, from the stables, by the shortest and most private route. In general, it is desirable to have the kitchen-garden close to the stable offices, so as to make some use of the walls of the latter for training fruit trees, and to shorten all the lines of communication for servants, as also the walk to the garden from the lawn front. Wherever it is practicable, the farm should adjoin the kitchen-garden, and, as it were, follow in the train of offices and useful appendages. In this view of the general arrangement of a villa and its offices, it appears that all the latter should be placed on one side of the dwelling-house, so as to leave the three other sides free. Wherever three sides of the dwelling-house are not free to be disposed of as the combined judgment of the landscape-gardener and Architect may direct, either the case must be anomalous, or some gross fault must have been committed. We would strongly recommend this to be kept in view, both by Architects and their employers, as a leading principle in determining the position of the offices relative to that of the house.

1647. *The Approach Road.* The whole train of offices and useful dependencies being disposed of, the subject next in importance is the direction of the road by which the dwelling-house is to be approached. Though this, like every other part of the subject, is necessarily treated of separately in a book, it must be considered together with all the other parts, and more especially the offices, in practice. The side of the house on which the offices are placed must, as has been already observed, in a great measure be determined by the direction in which the approach road advances to the house; so that these two parts are so intimately connected, that the one cannot be considered without the other. In the modern or natural style of disposing of the grounds about a house, the approach road almost always advances towards it in such a manner as to show two fronts at the same time. This is one principle; and, as we have already laid it down as another, that the offices must always be on that side by which the principal approach advances, it follows, that the first view of the house will generally show the dwelling as the principal mass, and the offices as subordinate and cooperating parts of the whole. Whenever the first part of the dwelling, therefore, which comes into view, is the offices, there must be something defective in their position, in the direction of the road, or in the disposition of the trees and scenery by which the house and offices are united with the grounds. In the ancient or geometrical style of laying out grounds, the approach road or avenue advances directly in front of the house; and here, also, the dwelling-house is the mass which ought first to meet the eye. The offices, in this case, are generally concealed from the view; either altogether, or till the spectator has arrived almost at the entrance front. The great object, in the ancient style, is, to present a full geometrical view of one front; that of the modern style, to show two fronts at once, or what is called by Architects an angular view. The beauties aimed at by the ancient style, whether with respect to the house or the grounds, were, to present regular, symmetrical, architectural views; the end aimed at in the modern style is, to present views which are irregular, picturesque, and natural. The direction of the approach road from the public road, till it advances nearly to the entrance front, may be considered as more legitimately within the province of the landscape-gardener than within that of the Architect; yet, still, the general principle by which it is directed ought to be alike known to both. In the ancient style, the grand object is, to obtain a straight line; because such a line is more architectural, and displayed, in a rude age, more decidedly a character of art and design. In the modern style, a winding line is preferred, as being more easy and natural, and, by displaying a greater variety of scenery, evincing a more refined taste. The ancient style of approach is displayed to greatest advantage over an even surface; the modern style, over a surface which is irregular. In the ancient style, when the two extreme points were once determined on, nothing could be easier than to lay out the road between them. In the modern style, when the two extreme points are determined on; that is, the point of departure from the public road, and that of arrival at the entrance front of the mansion; the laying out of the road between them calls into exercise a considerable degree of taste and judgment. As it is essential to this style that the line of road should be more or less curvilinear, the artist is required duly to consider what ought to be the extent of these curves, and how far they ought to deviate from a straight line. If he should be guided entirely by the surface; that, if very irregular, may induce him to trace a line too circuitous; and if even, to adopt a line without ease or grace. It may be laid down as a principle, that no winding approach can be beautiful where there is not an obvious reason for each of the windings. It may also be admitted as another principle, that, when the surface is very irregular, and the road changes its direction with every little obstruction, it will cease to have the character of a work of refined art. A third principle here occurs, to correct the tendency to error in either of the extreme cases of a very hilly or a very flat surface. This principle is, that the road, in every case, should be

easily travelled over; and from this principle are derived the following rules; viz., that, on a flat surface, this road should never deviate so far from the straight line as to be obviously very circuitous; that, on an irregular surface, it should never be turned aside by surmountable inequalities, so as to produce the same effect; and that, if not turned aside by inequalities, it should never pass over them in such a manner as to interfere with facility of communication. An expression of art, therefore, requires to be given, not only to the direction of the road, but to its inclination in the direction of its length. For this reason, on irregular surfaces, it will frequently be required to cut into or lower eminences, and to fill up or raise the surface of hollows or declivities. In effecting this, the greatest degree of skill is required, to maintain the ease and grace of a work of art, and to avoid the mere straightforward character of an improved turnpike road. Happily for the artist, trees can at all times be called in to his assistance; and the effect of these, in hiding defects and eliciting beauties, is all-powerful. Along the sides of a road passing over an irregular surface, trees may be placed so as to conceal bends in its direction, which would, if seen all at the same time, be considered too numerous; and on a flat surface they may be arranged so as to create an artificial cause for bends which could not otherwise be made without forfeiting all pretensions to good taste.

1648. *The Pleasure-Grounds.* In order to make the most of a villa residence, it is found desirable to have the grounds around the house laid out in two distinct characters. The surface on the entrance front should be so disposed as to be in a less refined style of design and ornament than that on the other fronts; or, at least, on that generally designated the lawn front, or that on the drawing-room side of the house. This side should, in all cases, look towards the best views which the situation affords; and the foreground to these views should be in the highest style of design, order, and keeping which it is intended that the villa should display. It is always desirable that this high style of art should embrace two sides of the house, a third side being the entrance front, and the fourth connected with the offices. We are here assuming the general outline of the ground plan of the house and kitchen-court to be a square or a parallelogram, merely to simplify discussion; but what we shall advance will apply alike to every form of ground plan. As the style of the grounds on the entrance front is decidedly inferior in degree to that on the drawing-room front, and as the former are generally depastured by sheep, deer, or cattle, it becomes necessary to form such a line of demarcation between them as will serve also as a fence. To conceal this fence, or so to manage it as to render it a work of art, or an architectural appendage to the house, is one of the nicest points of management in disposing of the connecting links between the house and the grounds of a villa residence. The most common resource is an iron fence; sometimes avowedly displayed, and at others studiously concealed, or formed so slightly as to be considered invisible; but in all cases a meagre and paltry contrivance, utterly unworthy of a high style of art. The sunk fence is another resource, which has been employed for separating the grounds of the entrance front from the lawn; but this also is unarchitectural, and, like the iron and wire fences, only to be adopted at such a distance from the house as never to be supposed to form any of the appendages which connect it with the grounds. The iron fence and the sunk fence being rejected, to what, then, are we to have recourse? Most decidedly, to a bold and avowed line of demarcation, of an architectural character, and in a style of design which shall harmonise with that of the house. Even a plain wall, broken in its lines by trees and shrubs, is superior to any fence not avowedly displayed as such, and not decidedly architectural. Here, then, is a medium of connecting the house with the grounds on one side of the entrance front, while the kitchen-court and stable offices afford a more conspicuous means of effecting the same object on the other. Here, also, the Architect will have an opportunity of displaying, in the wall, his inventive powers, in its line of direction, its height, its projections and recesses, the ornaments with which it is decorated, and in its partial concealment, and connection with the scenery, by occasional groups of trees and shrubs. To fit a Villa Architect for this purpose, he should study, above all other works, the writings of Uvedale Price, the work of Gilbert Laing Meason on the landscape-architecture of the great painters of Italy, and the essay on uniting the house with the grounds, by the late Thomas Hope. "In recommending to Architects to study the picturesque effects of buildings, the site adapted for them, and the accompaniments of terrace walls, architectural gardens, and other decorations, to set off their designs for villas," Meason observes, "we are influenced by a desire to raise and extend the theory and the practice of Architecture, to all that we consider belongs to the art. This was the case in Italy when the fine arts were in perfection, and great villas were laid out by artists who often combined the practice of painting with that of Architecture; and, until it be adopted in Britain, the designs of the Architect will never have justice done to them in the execution."

1649. *The Separation of the Lawn from the Scenery beyond it* may be considered as a continuation of the same subject; for here, also, the sunk wall or the iron fence has

been almost invariably resorted to. We do not object to these fences at a proper distance from the house; that is, at such a distance as to render it unnecessary for them to be made architectural appendages for connecting the house with the grounds; neither should we object to the wire fence in front of the house, in the case of cottages and cottage villas, where the house, from its smaller dimensions and picturesque low form, blends with the scenery, without the necessity of architectural appendages. In the case of all villas of any magnitude, however, we consider the architectural accompaniments of terrace walls, gateways, alcoves, stone seats, steps, pedestals, urns, and other mural and sculptural ornaments, essentially requisite to prevent the incongruity so ably exposed by Mr. Hope, of "launching from the threshold of the symmetric mansion, in the most abrupt manner, into a scene wholly composed of the most unsymmetric and desultory forms of mere nature." "These forms," he adds, "are totally out of character with those of the mansion, whatever may be its style of Architecture and furnishing." With him, we desire to surround the house with a garden, into which "the cluster of highly adorned and sheltered apartments that composes the mansion may, in the first instance, shoot out, as it were, into certain more or less extended ramifications of arcades, porticoes, terraces, parterres, treillages, avenues, and other such still splendid embellishments of art, calculated, by their architectural and measured forms, at once to offer a striking and varied contrast with, and a dignified and comfortable transition to, the undulating and rural features of the more extended, distant, and exposed boundaries; before, in the second instance, through another link, and a still farther continuance of the same gradation of lines and forms, the limits of the private demesne are made, in their turn, by means of their less artificial and more desultory appearance (increasing with their distance from the house), to blend equally harmoniously with the still ruder outlines of the property of the public at large." An eloquent writer on this subject, in the *Gardener's Magazine*, after objecting to the general incongruity between the English villa and its garden, on the same principles as Mr. Hope, observes, "We should condescend to borrow from our neighbours on the Continent some of that architectural taste in gardening in which many of them have so much excelled; we must engraft upon our own romantic harshnesses something that will accord better with the equipment of the interior of our residences; something like furniture and ornament; and not leap from our windows into jungles and steppes, and wildernesses, where the lion and the panther would be more at home than the 'lady with her silken sheen.' We must, in fact, adapt our gardens, those, at least, which adjoin the house, to the building, and make them a part of it; appropriate, and such as, in the times when those buildings were erected, were considered suited to each particular class. If we take a review of our country residences, we shall find them to be, or to have been, either the baronial castle, or the monastic and conventual houses, such as, at the dissolution of the monasteries, were granted to the great and powerful of their time, of which the greater part of many now remain, and are private dwellings; or the Elizabethan and Inigo Jones buildings; or the great square edifices, with projecting roofs, of William and Mary's time; or the Palladian palace and villa. To give these buildings gardens appropriate to their individual styles and eras of building would not only add truth and consistency to the character of each place, — an object hitherto sadly neglected, although generally allowed to be desirable, — but it would give also to the possessor an opportunity of introducing that description of garden ground which I contend to be best adapted to our climate. Each style of building would give us permission, as it were, to ornament, to furnish highly our gardens, to decorate them with masonry; to place statues, and vases, and balustrades, and steps about them; and to enrich them with that most charming of all garden ornaments, the terrace: all of which rich accompaniments, by carrying the eye from the interior ornaments of the chambers to the garden, would in a manner so connect our gardens with our houses, as to make them, what all, I believe, would wish them to be, a pleasurable part of them. The want of colour, so necessary to a cheerfulness of scene, would, at those seasons when flowers have ceased to bloom, be compensated for by the lights which would be constantly falling upon and playing about the architectural ornaments; and that courting of sunshine, which is so desirable, would be generally gained."

1650. *Rules for laying out Architectural Gardens*, the same writer observes, might be given without much difficulty. Each of the above-mentioned eras of building villas or mansions admits of architectural ornaments; "the taste in their disposition, and the skill in their execution, being determined by the style of the individual building. The terrace, or succession of terraces, of the baronial castle will not require the same ornament as the monastic terrace; nor will that, again, be so richly or gorgeously adorned as the Palladian terrace: and let it here be observed, by the way, that by a terrace is not always implied that elevated spot whence a commanding and distant view is obtained (a misconception of this description of ornament to a building entertained by many); but any raised, straight, and broad, paved or gravelled walk, on a level, running parallel

to, or surrounding, a building. Many, in these times, have chosen to misinterpret the original intention for which terraces were formed; and because some of the remains of them, and, no doubt, therefore, the finest and most agreeable, enjoy distant and extensive prospects, have imagined that, without that, no terrace could strictly so be called: whereas, I conceive, the main object of a terrace to have been for the purpose of obtaining in most, but particularly in bad, seasons, a dry and healthy promenade; and, no doubt, if from this promenade an extensive view were commanded, the enjoyment of the exercise taken thereon would be greatly enhanced. If we define a terrace merely as a long and spacious straight walk, no one will object to the introduction of it; and I think I may affirm, that all who possess one will agree with me in confirming the enjoyment they have derived thereon. Of those houses built in the reigns of Charles II., James II., William and Mary, and Anne, some exception to my original position may be judiciously made; for, to follow strictly the trim style of gardening which was originally adopted by their possessors, and considered then as appropriate, would be, in truth, to return to a style which was introduced in bad taste, and which ought, therefore, to be discarded. Where such houses remain, it will be well, perhaps, to keep up their gardens partially, introducing with them, or engrafting upon them, the better style of Palladian gardening, that, too, which immediately succeeded; by which we can only subject ourselves to the same species of reproach, if reproach it can be called, as that given to our munificent ancestors, when they completed the Saxon and Norman cathedral with the then newer style of Gothic."

1651. *The Italian Architectural Garden.* "It is a mistaken notion to suppose, that, because we do not enjoy the climate of Italy, we cannot, therefore, appropriate to this country the Italian style of garden. It is also a mistaken notion to suppose the Italian style of gardening peculiarly adapted to the Italian climate. Those who have visited Rome in the winter season will agree with me in enthusiastic admiration of the Roman gardens, at that period of the year. By an Englishman the gardens of the Villa Borghese and Doria Pamfili can never be forgotten. But, then, he must have visited them in winter; he must have seen and enjoyed them at that season, for the amelioration of the rigours of which they have been constructed; for even at Rome a winter has its rigours. Let him visit these gardens in summer, and he will find them a very Pandemonium. If his eyesight recover from the glare of their blazing ornaments, he will not so easily forget the intolerable heats he has found collected in them, and their almost total want of shade; for the shade of evergreens, even though they should be the beautiful *Ilex* or spreading stone pine, is not true shade to an Englishman, accustomed as he is to the delicate and umbrageous foliage of our deciduous natives, the oak, &c. By as much, therefore, as our climate throughout the year approaches to the climate of an Italian winter, by so much should we do wisely in adopting the Italian style of gardening. It is true, we have not marble in the same abundance; and, if we had, we have neither artists to execute figures and vases in that material at a moderate price; nor would these, when executed, bear the frost or damp of this country; and so far the Italian style is not fitted for this climate: but we have stone, and that in abundance, and of the most beautiful description, such as the Portland, the Bath, and the Ancaster, which will stand all weathers; and the two latter of which are so easy to cut, and so durable when cut, that the place of marble ornaments may be supplied by them at a very moderate expense. A plot of ground, of one acre only, attached to the mansion, laid out in the Italian manner, with its terrace, steps, balustrades, vases, fountain, and rectangular gravel walks, will add more to the cheerfulness of both the exterior and interior of that mansion, throughout the greater portion of the year, than five times the quantity of land laid out according to our present English style of gardening. What flower-beds, and those formal ones, corresponding in lines parallel to the gravel walks, may be introduced, will be made gaudy and rich for the summer season by annuals, of which, in colour, there is a great variety; and roses, care being taken to put but one kind of plant into each flower-bed; bulbous roots, such as snowdrops, crocuses, tulips, hyacinths, &c., will afford a spring crop of many colours; China asters, chrysanthemums, georginas, pelargoniums, &c., will decorate the autumn; and but a few winter months will remain for the architectural ornaments to display fully and solely those powers which, with the conjunction of the flowers, they have through the spring, summer, and autumn maintained. A garden of this sort is 'an extension of the splendour of the residence into a certain limited portion of the demesne; it is a sort of chapel of ease to the apartments within doors.' If it cannot justly be called a part of the mansion, it is at least a link of connection between that and the other gardens; and, for such other gardens, our own English style is as good as, and perhaps better than, the style of any other nation. In these gardens this rule should be observed, that, as they approach the park or forest, the wilder and more in character with that adjunct they become, till, by an apparently natural and easy step, the one amalgamates with the other. However strong contrasts, and

happy and unexpected transitions from one style of gardening to another, may be permitted, and perhaps with good effect, within the garden ground, yet, when the park is approached, no such trick should be allowed. The simple grandeur of our park scenery requires no raree-show work to attract attention; it stands unrivalled with its hundred accompaniments of wild splendour, which cannot but be materially deteriorated by any contrivances to show it off to advantage." (*Gard. Mag.*, vol. iv. p. 214.)

SECT. III. *Of adapting the Architectural Style and interior Arrangement of the House to the Character of the Situation.*

1652. *Certain Characters of Ground and Scenery* are supposed, by many, to have an analogy with certain styles of Architecture. Rude, rocky, hilly, and very irregular surfaces are said to require the Castle Gothic; fertile valleys, the Abbey Gothic, or monastic style; and rich extensive plains the Grecian or Roman manner. It is, no doubt, very natural to associate a rude style of scenery with the baronial castle; and an abbey or monastery with surrounding fertility; but the connection between Grecian Architecture and tame or rich scenery is not so obvious. However, in so far as these prejudices or associations exist, they ought to be taken advantage of by the Architect, in his choice of style. In so far as Architecture is entitled to be considered a fine art, the style adopted ought to exercise some influence on the imagination; and, therefore, whichever style may be selected, it ought always to be accompanied, as far as practicable, by such circumstances as may serve to heighten its effect on the mind. Thus, a castellated mansion, with towers and battlements, will more powerfully affect the imagination, when placed in a position favourable for defence, by its altitude, its rocky base, its proximity to a river or the sea, or by various other circumstances, than when placed on a tame, flat surface. At the first glance the spectator immediately concludes that it may have been a real castle in former times; and he readily becomes a party, as it were, to the illusion which it is desired to create. There are similar associations connected with villas in the monastic style; but few, at least in Britain, with purely Grecian villas. The associations connected with them are either classical, and of a description which can only affect the minds of those classical scholars who have studied Architecture; or purely architectural, and therefore confined almost entirely to Architects. Whenever, therefore, the artist wishes to affect the imagination, and to raise emotions of grandeur and beauty, or recall the images of antiquity in general observers, he must adopt one or other of those styles with which general observers are familiar. The truth is, that, in order thoroughly to enjoy an object, we must first understand it: now, for one person who knows and can comprehend the uses of the component parts of a Grecian elevation, there are numbers who are familiar with all the details of Gothic Architecture. Towers, battlements, buttresses, pointed windows, mullions, and porches have been, from infancy, before the eyes of every one who has been in the habit of attending his parish church; and, whenever they occur in other buildings, they recall a thousand images connected with the place of our birth, the scenes of our youth, the home of our parents, and the abodes of our friends. In this frame of mind how easy it is to be pleased!

1653. *In order to compare the Grecian Style with the Gothic*, or any of those which may be considered as indigenous to this country, with reference to their effect on the imagination, it is only necessary for us, first to take a view of a newly built villa in the one style, and then of one, also newly built, in the other. Let us imagine a Grecian villa now before us, with its portico, and regular symmetrical front; perfect in all respects as an edifice. What are the sentiments which arise in the mind on viewing it? Very few which can respond to any feeling already existing in the mind of the general observer. The columns, no doubt, carry back the ideas to the Grecian temples of antiquity; but these do not possess half the interest, in the present age, which attaches itself to a Gothic church. There are no ancient villas in the Grecian style, at least in Britain, to recall associations in their favour; and, that style of Architecture being chiefly prevalent in newly built cities, a villa in the Grecian style generally reminds us more of the town than of the country. A style of building which has this effect cannot be well adapted for a villa. What, then, are the inducements to build villas in the Grecian style? Is there any particular fitness in this style for the internal arrangement of a house in the country? Can such houses be rendered more commodious, more durable, or built more economically? No one will answer these questions in the affirmative. If, then, Grecian Architecture has but few associations connected with its external appearance to recommend it for the country, and if it be found not better than other styles in point of fitness and utility, by what means has it happened that it has been, till lately, so generally adopted in country houses? We believe that the principal reason why it was first introduced in the reign of James I. was its novelty at that time; and that, having then become the fashionable style, it has since been continued, partly for that reason, and partly from the general deference which is paid to any thing Grecian. The style is, we

believe, frequently adopted, merely as evidence which the love of it is supposed to afford of scholarship and taste. Let us next take a view of a newly built villa, either in any of the varieties of the Gothic style which have long existed in Britain, or in any of the mixed styles which have prevailed, or which still prevail, on the Continent. How various the associations which rise up in our minds, when viewing a successful imitation of a baronial castle, or of an old English manor-house! Even an Italian villa has its interesting associations; and though these associations can never be so generally agreeable to a native of Britain, as those raised up by the forms of Gothic Architecture, yet still they are recognised in such a manner as to excite emotion, from their frequent recurrence in the landscapes of the great artists of Italy. We thus arrive at the conclusion, that the styles of Architecture that have been most familiar to those who are to inhabit the edifices to be erected, are the best calculated for general use. It follows, also, from this, that any style which has been long in use will raise emotions; and thus, that, after a long period of time, the associations connected with the Grecian style will call up feelings in the mind of a Briton, as interesting as those now excited in him by the Gothic. Our approbation of the Italian style, which is of a mixed character, and has long been applied to domestic purposes, has, no doubt, its origin in this cause.

1654. *The Fitness of a Style for Accommodation, Comfort, and Convenience* may naturally be supposed to influence our judgments in respect to its external effect; but, in this point of view, our belief is that the Grecian, Gothic, and Italian styles are altogether equal. It is true, that if we consider it necessary that the Grecian style, when adopted in the country, should be as essentially symmetrical as it is, when applied to temples, there will be an end, at once, of all its pretensions to fitness for a villa residence: but this exact symmetry, though it seems essential for a temple, or any large public building, the principal use of which is to assemble great masses of men in one room, is not absolutely necessary where the occupants of a building are to be lodged in different rooms; and, when this is the case, the Grecian style is as applicable to a villa as the Gothic. It will not, we think, be denied, that all the details of the Gothic style are as much taken from a cathedral, as the details of the Grecian style are taken from a temple; and yet, in a private building in the Gothic style, it is never considered necessary that we should be guided by the general form and symmetry of the cathedral. The difference between the styles unquestionably lies much more in men's minds, and in the historical associations connected with them, than in the abstract forms belonging to them. We assert this with the more confidence in regard to forms, because those essential to use and occupation are precisely the same in both; viz., the square and the parallelogram for the ground plan; or the cube and long cube for the plan and elevation.

1655. *The Difference between a House in the Town and a House in the Country* lies much deeper than in mere style, important though we allow that to be. The great object of a house in town is concentration; the great object of a house in the country, the enjoyment of free air and of the external scenery. In the town, there is nothing to admire but what has been created by man and all that is beautiful to the eye is architectural. In the country, on the contrary, there are not only architectural beauties to enjoy, but the extensive and varied beauties of verdant scenery. It would appear, therefore, that much greater attention ought to be paid to Architecture in towns than in the country; and this, taking a general view of towns ancient and modern, will invariably be found to be the case. Country houses, or villas, on the other hand, will invariably be found to be less architectural; and, especially, less symmetrical, than dwellings in towns. This difference is clearly founded on the sound principles of utility and enjoyment. In the country, there are two leading principles which direct the disposition of the different apartments: the one is, shelter from the particular winds and storms which prevail in the particular situation; and the other is, the enjoyment of the particular views which are to be obtained of the surrounding country. The influence of these two principles we shall find pervading the villa residences of every age and country; and hence it is that, as town houses have in all ages and countries been concentrated and symmetrical, so country residences have, in all ages and countries, been comparatively scattered and irregular. The conclusion which we draw from these observations, as applied to our present subject is, that a villa residence ought to be characterised by extent and irregularity; and this conclusion agrees with that arrived at by Mr. Hope and other writers.

1656. *The Irregularity of the Style of Villas* has been illustrated and contended for by Price, Knight, Hope, Meason, and a number of other authors; while the concentrated and symmetrical style has never, so far as we are aware of, been advocated by any one writer as the most suitable for the country. We shall not here repeat the invaluable observations of Sir Uvedale Price, who, in his *Essays on the Picturesque*, was the first in the order of time, as he still is in the order of excellence, to draw attention to the beauty of irregularity in all country buildings, where the object aimed at is any thing

beyond bare shelter and utility; but, having already recommended the essay of Mr. Hope (which will be found in vol. ix. of the *Gardener's Magazine*), we shall conclude this section with some quotations from the work of Meason.

1657. *The Landscape Architecture of Italy*, Meason observes, is the result of time and of a great variety of circumstances. The Roman villas were, no doubt, originally Grecian edifices adapted to the particular situations in which they were placed; and we are certain, from the descriptions which remain of them, that they extended over the surface rather than towered in stories one above another. After Italy was invaded by the Goths of the north and the Saracens of the south, and became a prey to barbarians from one end of the country to the other, those who remained stationary, as proprietors of the soil, left their villas in the plains, and betook themselves to situations where they could with facility fortify themselves against the attacks of invaders. Hence the few villas, which we know to have existed in the middle ages, are in a mixed style of Roman and castellated Architecture: and this mixed style has prevailed in the villas of Italy from that period to the present.

1658. *The Transition from the Roman Villas* to the Italian castles or monastic establishments of the middle ages is thus given by Castellan, and G. L. Meason. Castellan maintains that several monasteries, built on the ruins of Roman villas, retain the ancient distribution of the parts of the buildings: the courts surrounded with porticoes, which are used for walks; the rooms entering upon the portico, without communicating with one another; the basins, with fountains in the courts; the terraces upon arcades; the oratories in the gardens; all these have a striking analogy to the ancient villa. At an ancient villa near Brundusium, our author found the *ambulacrum*, or covered walk, pretty entire. "One of the celebrated villas of Lucullus," observes G. L. Meason, "formerly belonging to Marius, and afterwards an imperial residence of Tiberius, situated on the promontory of Misenum (Capo Miseno), existed A. D. 480. To this retreat was sent, by the clemency of Odoacer, king of the Heruli Goths, the last feeble representative of the Roman emperors of the West, called in derision Augustulus. The villa had gradually been changed into a strong castle, to protect it against the sea attacks of the Vandals. These invasions by sea of the Vandals, and, subsequently, of the Normans and Saracens, ruined probably the crowd of Roman villas on the Neapolitan shores. The villas on the fertile plains of Italy would suffer from the invasions by land; but many villa castles or fortified residences remained after the tenth century, in the hilly districts of the Vicentine and Veronese territories; as their rural nobility descended into the cities of Padua, Verona, Vicenza, and Trevisa, and took part with the Guelf faction. In the thirteenth century, 150 castles were computed to be in the Milanese. It was probably to a Roman villa that Avitus, lieutenant of the emperor Maximus, and afterwards himself a short-lived emperor, retired, A. D. 460. It was situated near Clermont in Auvergne, on the margin of a lake, into which rushed a torrent of mountain cascades. The villa contained baths, summer and winter apartments, and porticoes. Sidonius, the son-in-law of Avitus, has, in imitation of Pliny, given a prolix but obscure description of it." (*Landscape Arch. of Italy*, &c.) The same author (G. L. Meason), in his graphic illustrations, has given an example, from a landscape of Giotto, of what appears to be "a monastery, constructed on a more ancient edifice."

1412

fig. 1412

He has also given an Italian baronial castle of the fourteenth or fifteenth century from Titian, characterised by round towers, fig. 1413; one from Breemberg,

1413

characterised by square towers, fig. 1414; and one from Giulio Romano, in which both round and square towers are combined, with something of the monastic character main-

1414

tained by gable ends, and a spire-like turret, fig. 1415. A fine example of a picturesque country-house, of the seventeenth or the beginning of the eighteenth century, is given

1415

from Francesco Solimene, the last of the old school of Italian painters, fig. 1416. This very picturesque residence was situated at the foot of Mount Vesuvius, and must have harmonised admirably with the surrounding scenery.

1416

1659. *The Beau Idéal of the Italian Style of Villa Architecture*, it is justly observed by Meason, is to be found in the landscapes of the great Italian painters, and more especially in the backgrounds of their pictures. Speaking of the examples which Italy and her artists afford to the rest of Europe, he says, "that there are no petty ornaments to detract from the effect of simplicity and breadth in the Architecture. None of the sky lines are broken by trifling turrets or meagre pinnacles. The towers are plain, or simply embattled; and the varied line is produced by the different heights of large massive parts. The projections in the façade may be considered, in many of these buildings, as too sudden and unconnected; owing, no doubt, to the additions made at different times: but the Architect has to study the value of bold breaks in a picturesque composition, which may produce strong light and shade in almost every position of the sun, yet so as not to interfere with the interior convenience of the mansion. The various forms of projections by which the parapets, whether of towers or of the whole façade of the building, may be supported, deserve the particular attention of the Architect; and here the Tuscan Architecture of Florence, and that of many existing Italian villas of the fifteenth century, will supply him with excellent examples. These objects in irregular Architecture, combined with the power of the owner of the future mansion to arrange his apartments in any way that his taste, or fancy, or habits may guide him, give to the Architect an endless variety of architectural compositions, in which his genius has ample room for display. Such edifices, spread over the country, would contribute most essentially to the beauty of British landscape. But, in following out this style, our artists ought to work on a large scale. No tower, round or square, should be elevated that cannot be made into useful rooms of proper dimensions, so that effect and utility may always be combined. The upper parts of the towers should never be loaded with unmeaning hanging watch-turrets, nor the grandeur of the general outline be broken down by ill-placed tasteless pinnacles. We must condemn the present taste for pinnacles, rising above the simple square tower, of the new churches around the metropolis. In correct Gothic Architecture, no pinnacle was uselessly introduced. 'An Italian,' Rose observes, 'wisely considers the Architecture of a house as connected with its position, precisely as he meditates a picture with reference to the light in which it is to be placed.'" (*Land. Arch. Italy*, &c.)

1660. *The present Country Seats of the Italians* have been, more or less, copied by most civilised nations of Europe, celebrated by poets, and "visited and admired by travellers: they have not, however, been described or represented as they deserve. They are arranged so as to produce the best effect; and advantage of the nature of the site has been taken with admirable skill. The regularity of the garden is, as it were, an accompanying decoration and support to the Architecture. The Architecture, sculpture, and gardens of these villas are often designed by the same hand, and concur in the general effect to produce perfect harmony. Many of the great painters, besides Michael Angelo, were Architects. Raphael superintended the building of St. Peter's for a time; he built a few palaces and churches; and we hope to see published a collection of his original architectural designs, found in the valuable library at Holkham. Giulio Romano planned several buildings at Mantua. Domenichino is said to have been too picturesque in his

city buildings. Paul Veronese was an Architect of great merit; and even Pietro da Cortona practised extensively in this branch of the fine arts." (*Land. Arch. Italy*, &c.)

1661. *As Examples of the Specimens of Italian Landscape-Architecture*, and Meason's remarks on them, we give the following: —

Fig. 1417 is from Raphael. "This fine edifice deserves the attention of an Architect. The outline against the sky is very picturesque, and the introduction of the column

1417

gives an agreeable pyramidal figure. The whole is so well connected, that it has the appearance of having been built at the same period. Drawn on a large scale, the building would have a much greater air of simplicity and grandeur."

Fig. 1418 is from Titian. "We have in this chaste design a very beautiful building, varied, yet extremely simple, and having all the parts well combined; which is owing

1418

much to the elevation of the central square mass, producing not only a fine general figure, but uniting the whole into a connected body. The large round tower, as a termination, adds the character of firmness to the whole edifice."

Fig. 1419 is from Claude Lorraine. "To the original part of the building, placed behind,

1419

have been joined much more modern additions in front. Here, again, the commanding elevation of the square tower gives that consequence to the edifice, without which it would have no effect. Hence Architects may observe how important it is to have one bold well-placed part in an irregular pile of building." If the reader imagine this square tower removed, the whole pile will not only appear tame, but there will be a want of that central resting place for the eye, which is essential to produce the effect of a whole. Let him also imagine a tower of equal height, raised over the lower mass to the right of the picture, and he will find the idea of a whole materially lessened; simply, because there would then be no centre to the field of vision. Place a higher tower than either between the two, and the idea of a whole will be restored.

Fig. 1420 is from Michael Angelo. " This edifice is taken from the picture of the Rape

1420

of Ganymede. It has a very picturesque appearance; and here, again, the high central tower unites the whole, and gives a pleasing sky line. The termination of such buildings by a massive round tower based a little below the rest of the building, gives, we think, the look of stability and firmness to the whole." In this picture, the trees, and the background of the centre of the building, are in some measure necessary to the completion of a whole; but they might have been dispensed with by a small tower, or even lofty chimney-tops rising out of the large square tower. The removal of the pyramidal top to the small tower on the right, would have also produced the same effect. The embattled terrace harmonises with the embattled parapets of the towers and of the right wing, and contrasts advantageously with the roofs of the square and round towers to the right of the picture.

1421

Fig. 1421 is from Claude "We have here a singular group of towers taken from a drawing by this great master. The whole is built for strength and security." Viewed as a dwelling, there is little appearance of habitableness in this collection of towers; but that very circumstance contributes to its effect as a castle. The whole group consists of eight towers, contrasted in dimensions, in height, in position, and in light and shade. Imagine the eight towers placed in a line rising from one level basis, and the building would have had little or no claim to attention, and certainly none to approbation.

With a view to modern Villa Architecture, this vignette suggests fewer hints than any which have preceded it. There are no projecting parts or appendages "shooting out," as Mr. Hope expresses it, in all directions among the surrounding garden scenery; no terrace serving as a basement; no steps or porch indicating an entrance; and no colonnade or arcade suggesting the idea of elegant enjoyment. Still, we may imagine a situation where such a tower might be built as an ornament, as a ruin, as a prospect tower, or for the purpose of commemorating some ancient castle, which may be supposed to have formerly stood upon the spot.

Fig. 1422 is from Sermonita. "The main tower appears to have on one side a semi-circular shape which we have not before met with. The sky line of the whole deserves

1422

the notice of Architects. We have here another example of low circular towers on the left, built to abut upon and protect the foundation of the large square tower."

Fig. 1423 is from Gaspar Poussin. "This is one of the largest edifices we have selected, and appears to form two sides of a square. Both in the façade and sky line there is much variety of outline. The other two sides of the square are formed by the walls enclosing the garden. If these walls had originally been higher and embattled, the whole would

1423

have been a very strong baronial castle of the largest dimensions. The building has a simple picturesque appearance, and may be advantageously compared with many large irregular structures lately erected in different parts of Britain."

Fig. 1424 is from Domenichino. "The round tower has been apparently the nucleus of this mansion. The other parts are likely to be the work of the fourteenth or fifteenth century; but whether the portico be ancient, or merely the addition of the painter, we cannot determine. The scenery is similar in the original picture. In calling the attention of Architects to the sky line of irregular buildings, we do not mean that the upper lines should cut against the sky; on the contrary, we think this has always a harsh effect. Buildings appear most agreeable when backed by wood or rising ground."

1424

Fig. 1425 is from Nicolas Poussin. "The arcade, over which there appears to be an upper terrace, has a grand and imposing effect, and the lower terrace unites the whole with the surrounding scenery. The round tower brings the pile to the pyramidal shape."

1425

1662. *Remarks.* The preceding vignettes are taken, with some slight alterations and additions, from the work of G. L. Meason (of which only a very few copies were printed); and we may state that they were taken with the author's permission; since, in a correspondence with him in the spring of 1831, just before his departure for Italy, he consented to our making whatever use of his work we pleased. Mr. Meason, at the same time, proposed to us to edit a new edition of his *Landscape Architecture*, incorporating with it a great variety of new matter, which, we hope, will not be lost to the public. Having stated this, we have now to recommend the young Architect to pause, and, turning back to those vignettes, to examine each separately, endeavouring to discover the causes of the satisfaction which they afford him. We advise him to do this before perusing the remaining part of this paragraph.

Fig. 1412. The beauty here depends a good deal on the different forms of the terminations of the towers. Two of these to the right are of the same figure, and two on the left are of different figures; but the greater distance of the tower on the extreme right renders it smaller in appearance; and, by a difference in dimension, completes the variety. The contrast between these smaller pointed towers, and the square tower with battlements in the centre of the group, contributes materially to the impression or effect of the picture; and the height of this square tower contributes, with that of the highest spire, to the formation of a centre to the field of vision; or, in the language of art, to the production of a whole.

Fig. 1413. The effect here is produced by the same form in contrasted positions. In the preceding vignette, the contrasts in the forms and styles of Architecture was so great as to produce a variety almost approaching to discordance; here the sameness of the forms is such, that, notwithstanding their contrasted position, the result is a variety of an opposite kind, so tame as almost to border on monotony.

Fig. 1414. This picture consists of the same forms, of different dimensions and heights, with two small towers, which may be considered as chimney-tops, and which

serve to attract the eye towards a centre, and to form a whole; this whole, however, depends a good deal on the exterior scenery.

Fig. 1415. Considerable variety of form, disposition, and outline; and the idea of a whole produced by the central round tower, and its spire-like termination.

Fig. 1416. Great variety in disposition, and the group completed by an elevated rectangular tower, terminating in a smaller division of the same with pinnacles.

Fig. 1417. A still greater variety of form and disposition, finely scattered over an irregular surface, and the unity of the whole maintained by an elevated central column.

Fig. 1418. An extensive habitable-looking assemblage of grand forms. The character is decidedly grand from the breadth; but the idea of a whole less complete than in the preceding and following vignettes, from the want of a central elevated projection, or tower. This very want, by rendering the edifice less measurable by the eye, contributes to its grandeur.

1663. *Whatever may be the Style of Architecture adopted for a Villa*, and whether the general form of the house be symmetrical or irregular, there are three points which require the particular attention of the Architect: these are, the porch, or portico; the colonnade, arcade, or veranda; and the chimney-tops. We can hardly conceive a country-house, of any beauty, in which considerable attention has not been paid to these three requisites, so as to render them prominent features in the dwelling.

1664. *A Porch, or Portico*, can never be dispensed with in a country-house; because independently of its real utility in protecting the door and entrance, it serves to point out that part of the house to a stranger, to lend importance to it, and to afford an opportunity of architectural display. The porch, or portico, is, indeed, in a great measure, a characteristic of a country-house, since it is not generally found in ordinary street-Architecture; and, where it does occur, it indicates a superior description of dwelling: whereas, the humblest cottage in the country has, or ought to have, its porch. Porches, then, being comparatively indispensable in the country, and as, in order to enhance the interest of any class of buildings, it is desirable to take advantage of every circumstance which can add to their distinctive character, this is another argument why the porch should never be omitted. Where a carriage is kept, we think the porch, or portico, ought always to be of sufficient dimensions to admit of driving under.

1665. *Colonnades, Verandas, and Arcades*, though not so essential to a country-house as the portico, or porch, are yet so characteristic of a dwelling in the country, that we think one or other of them should very seldom be omitted. They are not only calculated to be useful, as connecting passages between one point and another; but as places of shelter and protection for walking in during inclement weather, or for sitting in during hot sunshine. At all events, even if they were of less use than they are, they are so ornamental, and such evidences of elegant enjoyment, that we would rather court an opportunity of introducing them, even if they were of little or no use, than forego their effect in an architectural group. Every style of Architecture admits of its particular character of arcade or veranda; and the forms of the supports, the roofs, the parapets, and the openings between the supports, admit of endless variety of form and decoration. A Grecian house in the country, without a portico or a colonnade, is one of the most dreary of architectural elevations, and is calculated to call up any associations rather than those which belong to the Tusculan villa of Pliny, which "had a spacious portico, a porch built after the ancients, a second portico, and an enclosed portico." But it is frequently contended, a judicious critic observes, that the Roman portico is but ill adapted to our climate; and that colonnades and porticoes, so delightful beneath the sunny skies of Greece and Italy, are, in this country, at best but beautiful and costly absurdities, in which propriety and comfort are sacrificed to display. It is urged, that, however tasteful they are considered as mere decorations, the application of them, in modern Architecture, is at variance with one of the first principles of correct taste; namely, that nothing can be essentially beautiful that is misplaced and misapplied. That the colonnade was admirably adapted to the latitude of Greece and Italy, no one can dispute; but, surely, it does not thence follow, as our objectors would have us infer, that it is worse than useless in our island. As well might these critics say, that an umbrella is excellently contrived to serve as a screen against the rays of a tropical sun; its very name indicates its destination; and, consequently, that it is highly absurd to use it for any other purpose than as a parasol. Those who inveigh against the application of the colonnade, as a mere architectural luxury, at once expensive and inconvenient, appear not only to forget that the sun does sometimes actually unveil his face to us, and that shade is desirable during some portion of the year, even in this formidable climate of ours; but, also, to forget that what, in a hot climate, is adopted for the sake of shade, may here, with equal propriety, be employed for the purpose of shelter. Neither do they consider that we can derive both advantages from it: shade in summer, when the sun is high; and shelter in winter, when that luminary is too low in the horizon for the

colonnade to cast a shadow of such depth as to darken the rooms before whose windows the columns project. (*Lib. of the Fine Arts*, vol. i. p. 188.) To arrive at a just conclusion on this subject, it seems to be only necessary to determine the principle on which exotic Architecture is introduced at all. Now, we conceive, it will not be contended that it is introduced because its interior arrangements are better adapted to our wants than those of our indigenous Architecture. It must, therefore, be introduced on account of the beauty of the style; and, as porticoes and colonnades are essential to this style, it is evident that, for this reason, independently of all other considerations, they cannot be dispensed with. In our opinion, it is quite a sufficient argument for the introduction of every component part of this sort in a villa, that it adds to the beauty of the general effect, and is not inconsistent with convenience and enjoyment. After a certain point has been passed on the road from necessities to superfluities, beauty is use.

1666. *On the Subject of Chimney-tops* we have enlarged at some length in Book I. They are essential features to human dwellings of every description; more especially in climates where they must be used for heating as well as cooking. Many consider that the chimney-tops ought not to be shown in Grecian Architecture; but they can assign no reason for this, except that they are not seen in Grecian temples. We know nothing of the Grecian villas, and very little of those of the Romans; but, if we were even perfectly certain that, in the villas of Pliny and other men of taste of his time, the chimney-tops were concealed, we should say that the taste which dictated their concealment was bad. Our opinion is, that the chimney-tops ought to be as conspicuous in a dwelling in the Grecian style as in any other; and that the British Architect, so far from having to regret the necessity of introducing chimney-tops into his dwellings, ought to hail that necessity as one cause why the British villa might excel every other in the world, and in many examples does excel them. How much do the Italian villas not owe to their chimney-tops, their campaniles, their balconies, and their open watch-towers!

1667. *The two grand Defects of the Villa Architecture of Britain* are, want of union with the ground and the surrounding scenery, and want of skill in the management of the chimney-tops. Our main object, in this chapter, has been, to draw the attention of the young Architect to these two points; believing them to be by far the most important for producing the kind of effect and beauty required in a villa Perhaps the next point is the disposal of the principal apartments in such a manner as that they may command the best views which the situation affords. When this is done, it will generally produce an irregular ground plan, extending over a considerable surface; and this is always highly favourable to the character required in a villa. Villa Architecture ought, in our opinion, to form a distinct part of the profession of an Architect; and with this branch ought to be united the profession of a landscape-gardener. This union was long ago recommended by Knight, Uvedale Price, Hope, Mason, and other writers; and we believe its necessity is felt by some of the first Architects of the present day. Our opinion, decidedly, is, that no great improvement can take place till the professions are united; and, with a view to this end, we shall subjoin another paragraph to this already too long section, to suggest a mode of study for acquiring both professions.

1668. *As Graphic Illustrations of the Principles* which we have endeavoured to lay down in the preceding paragraphs, we shall refer to the villa of the late Thomas Hope,

1426

Esq., at Deepdene, Surrey, and to the architectural gardens formed by the late Earl of Shrewsbury, at Alton Towers, in Staffordshire. The first is one of the finest examples

in England of an Italian villa, united with the grounds by architectural appendages; and the second exhibits one of the most extraordinary combinations of garden building with garden scenery, any where existing in Europe.

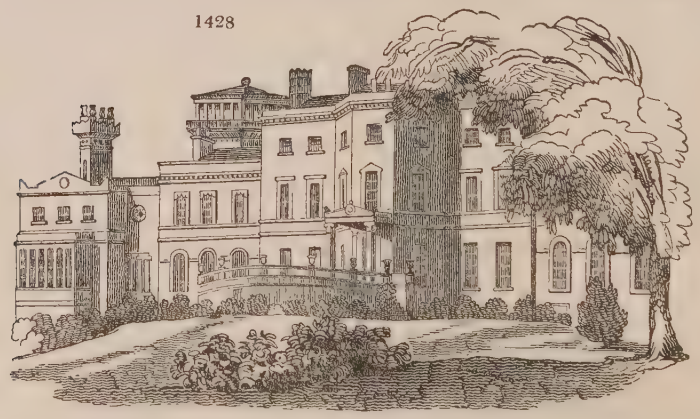
Fig. 1426 is the entrance front of Deepdene; in which the offices to the right are not shown, but they extend to a distance equal to the length of the house, and are highly varied, and architectural.

Fig. 1427 is a view of the south front of Deepdene; showing the conservatory, and the terraced garden in front of it.

1427

Fig. 1428 is a view of the north-west, or garden, front; in the centre of which will be seen a projecting semicircular terrace, with a parapet, ornamented by vases, and on the summit a prospect tower. It is proper to mention that these views, which are reduced from those published in *Neal's Views of English Country Seats*, do not do justice to this

1428



very beautiful place, because they are not sufficiently extended to the right and left to show the skilful manner in which the architectural and sculptural ornaments are blended with the garden scenery: but we hope, imperfect as these views are, they are sufficient to show how much Deepdene deserves to be visited, and attentively studied, by the Villa Architect. Both the house and the grounds were arranged entirely from the designs of Mr. Hope, under the direction of P. Atkinson, Esq., Architect.

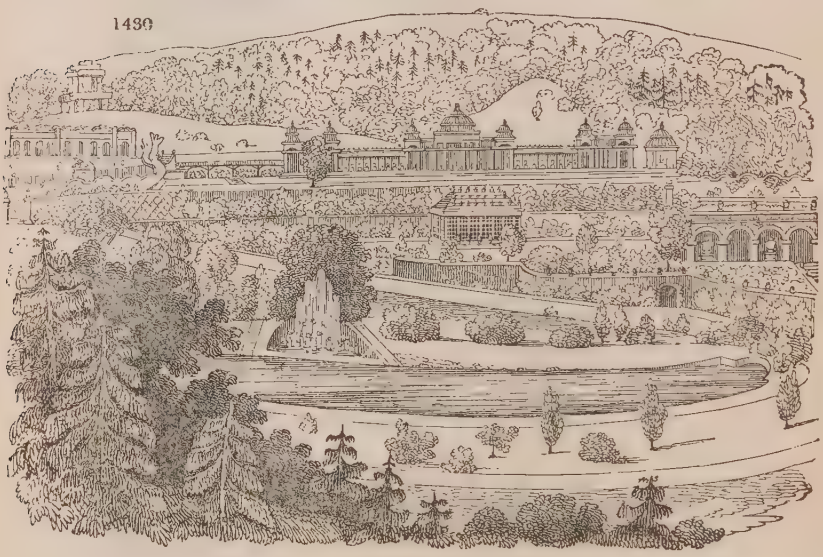
1669. *The Valley Garden at Alton Towers* was formed in a scene richly varied with wood, water, and rocks, and naturally in a high degree romantic. The late Charles earl of Shrewsbury began to ornament it with walks and garden buildings about 1814, and continued employing on it hundreds of labourers, mechanics, and artisans, from that time till his death, in 1827; consulting a number of artists, and, among others, ourselves. The Architects employed were chiefly Thomas Allason, Esq. and Robert Abraham, Esq To the present earl, and to his very ingenious and obliging clerk of the works, Mr.

Fradgley, we are indebted for a number of plans and views, some of which we shall here lay before our readers.

Fig. 1429 is a general view of the north side of the valley, as seen from a point in the south side, taken from a drawing obligingly lent us by Mr. Abraham, and made by Mr. Abraham, jun., on the spot in 1827.

Fig. 1430 is a view by Mr. Fradgley, taken from a point on the south side of the

1430



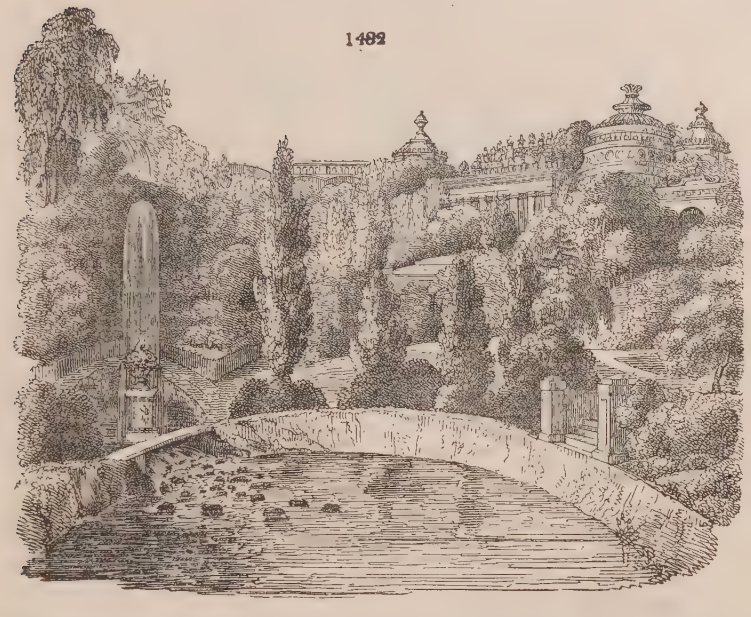
valley, and showing part of the north side. The conservatories are here conspicuous objects; and to the left is seen an imitation of Stonehenge.

Fig. 1431 is a view from a point on the north side of the valley, showing the pagoda fountain in the bottom; and to the left, in the background, the towers of the house.

1431

Fig. 1432, which is taken from a point on the north-west side, shows a fountain, cascade, and basin in the bottom, to the right part of the large conservatories, and in

1482

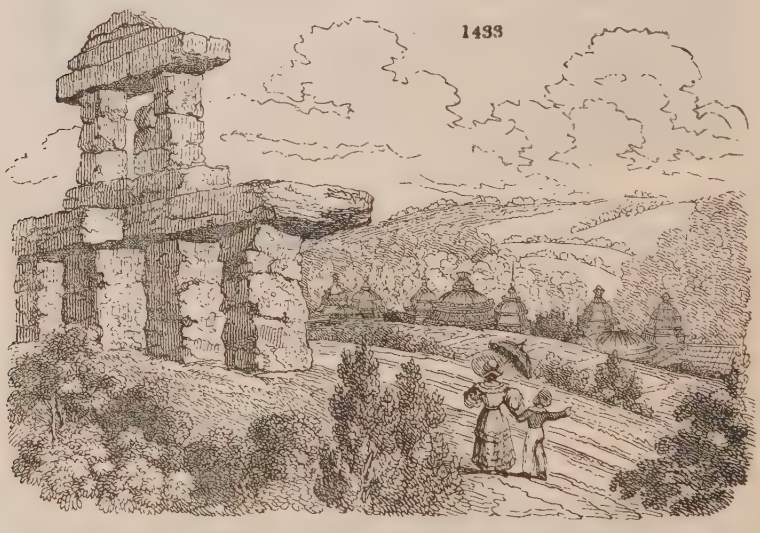


the distance an arcade, which separates the upper part of the valley from the lawn in front of the house.

1670. *We visited Alton Towers* in 1826, and again in 1831. On the former occasion we arrived at the house, from Uttoxeter, in the month of October; and on the latter, from Cheadle, in July. By the road leading from Uttoxeter, we came unexpectedly close to the house, and near the head of the north side of the valley, which contains the chief wonders of the place. The first objects that met our eye were, the dry Gothic bridge and the embankment leading to it, with a huge imitation of Stonehenge beyond and a pond above the level of the bridge alongside of it, backed by a mass of castellated stabling. Farther along the side of the valley, to the left of the bridge, is a range of architectural conservatories, with seven elegant glass domes, designed by Mr. Abraham, richly gilt. Farther on, still to the left, and placed on a high and bold naked rock, is a lofty Gothic tower or temple, on what is called Thomson's rock, also designed by Mr. Abraham (and seen on the right of fig. 1429), consisting of several tiers of balconies, round a central staircase and rooms; the exterior ornaments numerous, and resplendent with gilding. Near the base of the rock is a corkscrew fountain of a peculiar description, which is amply supplied from an adjoining pond. Behind, above, and beyond the range of conservatories, are two lakes; and beyond them is another conservatory, curiously ornamented: below the main range of conservatories are a paved terrace walk with a Grecian temple at one end, and a second terrace containing a second range of conservatories. The remainder of the valley, to the bottom, and on the opposite side, displays such a labyrinth of terraces, curious architectural walls, trelliswork arbours, vases, statues, stone stairs, wooden stairs, turf stairs, pavements, gravel and grass walks, ornamental buildings, bridges, porticoes, temples, pagodas, gates, iron railings, parterres, jets, ponds, streams, seats, fountains, caves, flower-baskets, waterfalls, rocks, cottages, trees, shrubs, beds of flowers, ivied walls, rockwork, shellwork, rootwork, moss-houses, old trunks of trees, entire dead trees, &c., that it is utterly impossible for words to give any idea of the effect. There is one stair of 100 steps; a cottage for a blind harper, as large as a farm house; and an imitation cottage roof, formed by sticking dormer windows, and two chimneys, accompanied by patches of heath to imitate thatch, on the sloping surface of a large grey mass of solid rock. This, seen at a distance, protruding from a steep bank of wood, bore naturally some resemblance to the roof of a cottage grey with lichens; and the chimney-tops and windows were added, to complete the idea. As the sandstone rock protrudes from the sides of the valley in immense masses, abundant use has been made of it to form caves, grottoes, caverns, and covered seats; it has even been carved into figures. in one place we have Indian

temples excavated in it, covered with hieroglyphics; and in another, a projecting rock is formed into a huge serpent, with a spear-shaped iron tongue and glass eyes. There is a rustic prospect-tower over an Indian temple, cut out of solid rock, on the highest point of the north bank; and in the lowest part of the valley there are the foundation and two stories (executed before the death of the late earl) of an octagon pagoda. This pagoda was intended to be eighty-eight feet high. It is placed on an island, in the centre of a small pond, and was to have been approached by a Chinese bridge richly ornamented. The diameter of the base of the pagoda is forty feet, and there were to have been six stories, the lower one of stone, and the others of cast iron. From the angles were to have been suspended forty highly enriched Chinese lamps, and these were to be lighted by a gasometer fixed in the lower story. Besides the lamps, there were to have been grotesque figures of monsters projecting over the angles of the canopies, which were to spout water from their eyes, nostrils, fins, tails, &c.; a column of water was also to have been projected perpendicularly from the terminating ornament on the summit of the structure, which, from the loftiness of the source of supply, would have risen to the height of seventy or eighty feet. This fountain was designed by Mr. Abraham; but only the lower story has been executed. The pagoda, the Gothic temple (seen to the right of fig. 1429), the range of gilt conservatories, and the imitation of Stonehenge, fig. 1433, form the leading artificial features of the valley. The valley

1433



itself is upwards of a mile in length: it gradually widens from its commencement at the stone bridge, with the pond above it, till it terminates by opening into the wide valley containing the Chumet (there a considerable stream) and a navigable canal. This immense valley, it is said, the late earl intended to cover entirely with water; and, as it would have saved the canal company several miles of canal, they offered to form the dam, or head, at their own expense. This lake, of some thousands of acres, would have been as easily produced as that of Blenheim was by Brown.

1671. *In approaching from Cheadle*, we arrive in front of the castellated stables, and see the abbey, fig. 1434, across the pond above the level of the bridge. Proceeding a little farther towards the dry bridge, Stonehenge appears in the foreground, and the tops of the seven gilt glass domes of the main range of conservatories below (as in fig. 1433.). Raising the eyes, the lofty Gothic temple appears on the left of the picture; and on the right, across the valley, the harper's cottage. In the centre of the picture over the domes in the foreground, the valley loses itself in a winding bank of wood, in a style of great grandeur and seclusion. None of the details of the valley here obtrude themselves; and the effect, after passing through a wild country exhibiting no marks of refinement, is singularly impressive. It fills the mind with astonishment and delight, to find so much of the magnificence of art and the appearance of refined enjoyment, amidst so much of the wildness and solitary grandeur of nature. The imitation of Stonehenge, too, is a feature in artificial landscape which we have not elsewhere seen;

1484

and a stranger is puzzled and confounded by finding a stream and a small waterfall supplying a lake on what he conceives to be the highest point of high ground.

1672. *The Scenery of the Valley of Alton Towers* is not here presented as a model for imitation: on the contrary, we consider the greater part of it in excessively bad taste, or rather, perhaps, as the work of a morbid imagination, joined to the command of unlimited resources. Still, however, there are many excellent things in it, and both the good and the bad well deserve the attentive study of the young Architect. Indeed, we know no place in Britain, and only the Isola Bella on the Continent, capable of affording, both by faults and beauties, so much instruction to the young artist. We say faults, as well as beauties, since we are of opinion that the study of the former, in order to trace the causes which have produced them, may be quite as useful to the student as that of the latter. The house at Alton Towers is a magnificent pile of castellated and abbey Architecture; and the gallery of armour, the picture gallery, and the conservatory, are in a high degree extensive and splendid. A more detailed description of Alton Towers, illustrated by numerous engravings, will be found in the *Gardener's Magazine*, vols. vii. and ix.

1673. *The Architect who intends also to be Landscape-Gardener* should begin by passing a year in a botanic garden, or in such a garden as those of the London or Caledonian Horticultural Societies, in order to acquire a correct knowledge of the names, heights, characteristic forms, and colour of foliage of all the trees and shrubs which will stand the open air in this country; and of some of the principal families of herbaceous plants. To do this effectually, he ought to make a distinct sketch of one individual of every species and variety of tree and shrub; and at the same time he ought to make other sketches combining different species and varieties in groups. By reading, he will become acquainted with the native countries of trees, and with the associations connected with them, as to soil, character of surface, &c. For example, certain trees, such as willows, alders, &c., always growing in low moist situations, are associated with the idea of damp, and should never be planted near a house, or where it is intended to convey the idea of dryness. The time thus spent would also familiarise him with the routine practices of gardening, and with the construction and uses of hot-houses and other garden buildings, to such an extent as to enable him to profit from afterwards reading gardening books; and thus, by thoroughly understanding the uses of garden structures, to be able to improve them. One year thus employed by a youth of seventeen or eighteen, who had previously received a scientific education, and was accurate and expert in sketching from nature, would form his elementary instruction in landscape-gardening. Let him then be put under an Architect whose practice lies chiefly in the country; and, after acquiring a thorough knowledge of architectural drawing in all its departments, and making himself master of all the best books on the subjects both of Architecture and landscape-gardening, let him endeavour to become an assistant to a Villa Architect. While in this capacity, let him lose no opportunity of sketching landscapes containing villas and garden scenery, from nature; and at the same time let him refresh his memory from time to time with the names of trees and shrubs, and their characteristic forms and modes of growth. By such a course of study and practice, a young man who has a natural genius for the arts of design (and no other should attempt the villa department of Architecture) will acquire a sufficient knowledge of landscape-gardening to enable him to lay out grounds, with the same assistance from the kitchen-gardener, as he receives, in designing and estimating a house, from the builder. One thing, however, is essential, and, without it, all the other acquirements are insufficient for enabling any young man to join the two arts; and that is, a thorough knowledge of perspective, joined to a great facility in sketching every description of object, more especially landscape and architectural scenery, from nature. If there is one test rather than another by which the taste or no taste of an Architect can be detected with certainty (always supposing that he is master of the mechanical rules of the art), it is the degree of perfection which he has attained in sketching general scenery.

1674. *To enable an Architect already in practice to acquire a knowledge of Landscape-Gardening*, we recommend him to procure access to some botanic garden containing a rich arboretum, of which there are only two in the neighbourhood of London; viz., that of the Messrs. Loddiges at Hackney, and that of the Horticultural Society, at Chiswick. Having done this, let him take portraits of all the trees and shrubs of which the arboretum consists, in the same manner as we have before recommended for the pupil to do; and let him, at the same time, endeavour to acquire all the knowledge of gardening generally that he can. The mornings, from six to nine, during the three months of summer, may suffice for the garden visits, provided the Architect be an expert draughtsman. (For a work which we contemplate on Landscape-Gardening, we have had sketches taken of most of the species and varieties of trees and shrubs in Messrs. Loddiges' arboretum; and we find that one month, at the rate of nine hours a day, would be sufficient to take portraits of the whole.) After this we would recommend the Architect to visit all the villas that he can, and to take memorandum ground plans of the general distribution of the house, offices, gardens, roads, and walks belonging to each; and also to make views of the different houses, in connection with the scenery around them. While going through this course of study, let the Architect, at his leisure, make himself master of the gardening works of Shenstone, Gilpin, Whately, G. Mason, Mason the poet, Allison, Price, Knight, Repton, Dugald Stewart, Hope, G. L. Meason, Gerardin, Delille, Morel, Watelet, Hirschfeld, and Quatremere de Quincy. We may add to these the perusal of a number of papers on the subjects of Landscape-Gardening and of Garden Architecture, in the *Gardener's Magazine*. Many persons think that all that is required to constitute a landscape-gardener is, to have studied and sketched natural scenery, and to be able to imitate that scenery in artificial grounds; but unless this imitation be made in the spirit of art, which it can only be, in the native or modern style, by the use of exotic trees, it becomes, instead of an imitation, a mere mimicry of nature; and to this mimicry on the one hand, and a tame monotony on the other, may be referred half the villa landscape or park scenery of Britain.

Chap. II.

The Beau Idéal of an English Villa.

1675. *In order to give our readers a Picture of a modern English Villa as it ought to be*, we here present them with the description of an imaginary one, which has been drawn up, and illustrated with plans and elevations, by a highly esteemed contributor and amateur Architect. Our readers, we think, will allow that this gentleman is singularly well fitted for the task which we have prevailed upon him to undertake. So complete a knowledge of the subject, so much power of conveying his ideas both by verbal description and graphic illustration, and so much taste and discriminating judgment in Villa Architecture, are seldom, indeed, to be found united in the same person. For our own part, we know nothing of the kind that can be compared with the following description, unless it be that which Pliny has given us of his own villas; but the value of our modern Pliny's description is greatly enhanced by its being accompanied by graphic illustrations. We have applied to this picture the term *beau idéal*, not that there is any thing in it that may not be found in hundreds of villas in England; but because there may be few at the present time in which the whole are united. Indeed, the time for such villas is rapidly passing away in this and in every other country; and we must confess, that, did we look forward to the continuance of such a state of society as that here depicted, in which one portion of mankind is placed so immeasurably above another, it would have given us pain to present this picture. Our consolation, however, is, that it will soon become matter of history, and only be referred to by Architects to afford hints for smaller villas, and for inns of recreation. We shall first lay before our readers the verbal description, and afterwards give the delineations, with their references.

Sect. I. *The Beau Idéal of an English Villa described.*

1676. *The Situation.* The word villa was originally used by the Romans to denote a farm house, with the offices requisite for the accommodation of a husbandman. Afterwards, when luxury increased, the term villa was applied to the country residence of an opulent Roman citizen; and it is in the same sense that we now use it to signify a gentleman's residence in the country. As a villa is to be a place of agreeable retirement,

and not one of seclusion from the world, it should be situated, if possible, in a beautiful country, within reach of a public road, and at an easy distance from the metropolis. Were I to select a situation for a residence of this description, I should choose a country neither flat nor mountainous; varied with hill and vale, and rather approaching to the mountainous than to the dull monotony of a level surface. I should prefer a situation removed about a mile from a great public road, and about ninety miles, or a day's journey, from the metropolis. Here I would enclose a park of 100 or 150 acres; bounded on the north and west sides of it by lofty wooded hills; on another side, by a road; and, elsewhere, by the enclosed country of the district: the surface of the park varied, but generally inclining to the south, with a rapid stream of water passing through it at no great distance from the site of the house. The park, in form, should be irregular, neither round nor square, but the length greater than the breadth. The country itself would, in great measure, determine the line of the boundary fence. Near to the woody hill, on the north side of the park, on a gentle eminence, should be the situation for the house; and I would so place the principal front as to be seen from the public road, and to command a beautiful and extensive prospect over a fertile country; having in the middle distance a town or village, with its "heaven-directing spire" reflected in the broad reach of a noble river, and in the extreme distance a mountainous country, or the sea; the foreground of the view to be well broken up by the timber in the park. The house should stand near the north boundary, nearly but not quite in the centre of the length of the park, which I would divide into three unequal portions. That portion which would be before the house should be an open lawn of an irregular shape, crossed obliquely by the stream widened in parts, and having the banks fringed with underwood and a few trees; the lawn itself being bordered irregularly with thorns, holly, furze, fern, and trees; and varied, where the surface indicated a place for them, with groups or single trees. The other two portions I would make unequal, the smallest towards the village. These should be laid out in imitation of forest scenery, with open glades and thickets, an irregular lawn in each, with occasional openings to the principal lawn before the house, and to the distant prospect, or any picturesque object in the surrounding country; taking advantage of the inequalities of the surface, and following as closely as possible the most beautiful natural scenery. An irregular green drive or walk might be formed round the whole. As to trees, I would have every kind of forest tree that the soil and space would allow; but I should prefer the oak, sycamore (one of the noblest of forest trees when old), the elm (narrow-leaved), Spanish and horse chestnuts, the maple, hornbeam, and a few others. Of course, I should add lower growths, such as thorn, holly, broom, fern, and even furze. To have a close even turf, which is one of the chief beauties in park scenery, I should keep it well stocked with cattle, young horses, sheep, and, if possible, a few deer. I have seen many parks, beautiful in themselves, but conveying an unpleasant feeling of dulness and solitude. Cattle, &c., always give a certain air of cheerfulness to a park scene; but still the effect is often solitary, where there is no appearance of human habitation besides the mansion. To obviate this loneliness, I would introduce a few buildings. Thus, I would have the church within the enclosure of the park, near the entrance gate, concealed partly by wood; but so situated that the tower and a portion of the church might be seen from the house. An ornamental temple or summer-house; a pigeon-house, often a very picturesque object; the keeper's lodge, which should be within the park; and even a few gables of the farm buildings, seen at a distance; would all contribute to give the effect of cheerfulness and a pleasing variety to a richly wooded park. I should even wish to have a public footpath across it, and within sight of the house; though at such a distance as to be no inconvenience. To me, nothing is more cheerless than that exclusive solitary grandeur so much affected in the present day, which forbids the poor even to set a foot within the precincts of greatness. As the most beautiful landscape is incomplete without figures, so the general effect of a park is always lonely, unless it have a footpath frequented by the picturesque figures of the labouring classes, and giving life and interest to the scene. Even the line of a footpath is in itself beautiful, and breaks the monotony of the green turf. If it be objected that a footpath is a nuisance, I answer, it is seldom found to be so in a retired situation, where the comforts of the poor are properly attended to; where the labourers have constant work, good wages, comfortable cottages, and ground on which to occupy their leisure time; and where there are proper national schools, in which the children are taught their duty, and kept out of mischief. They are the neglected poor who are mischievous and dishonest; and in a populous neighbourhood, abounding with squalid poverty, a footpath might be a nuisance, which I should willingly dispense with.

1677. *The Approach* to a residence is commonly one of the most important features about the place. A villa should always form part of a village, and be placed, if possible, on rather higher ground, that it may appear to be a sort of head and protector of the surrounding dwellings of the poor, as it ever was formerly; many of the finest of

our ancient residences being close to towns and villages. Supposing, then, that the estate is bounded on one side by the great public road, about a mile from the house; I would form a good parish road from the most convenient point in the public road, through a pretty enclosed country, watered by the stream from the park, which I should cross by a bridge of one or two arches, near the parish mill, and thence gently ascend to the village, passing among the scattered farm houses and cottages, with their pretty gardens and orchards, crossing the village green, on which should stand the school house shaded by lofty trees, to the other extremity of the village, where a handsome arched gateway should form the entrance to the park. Passing through the gateway into an open glade of oaks, the church would be seen at a little distance among the trees, through which the road is continued with a gentle ascent, till the house suddenly presents itself, with its stables and offices, backed by a woody eminence; and, sweeping across the plain in front, through some scattered trees and hollies, you at length reach the steps of the porch.

1678. *Exterior Architecture and general Arrangement of the House.* Before I describe the interior of the villa, it will be proper to say something of the style of the building and of its external appearance. There are many reasons which lead me to give a preference to the mixed style of Architecture, called the old English style, for a gentleman's residence in the country. For instance, it is more picturesque and ornamental; it accords best with rural scenery; and, as it admits of great irregularity of form, it affords space for the various offices and conveniences necessary in a country-house. It is also, I think, better suited to our climate than the Grecian style, which requires porticoes, projecting cornices, and windows of moderate size, &c.; all which circumstances tend to make the house gloomy, and intercept the light. The old style, also, allows more variety of ornament upon the roof, such as the stacks of chimneys, gables, pinnacles, turrets, and other things of importance to the general effect of a building to be seen at a distance: whereas, in the Grecian style, which requires perfect symmetry of form, and the prevalence of straight lines, the offices and chimneys are commonly excrescences offensive to the eye of genuine taste. For these and other reasons, therefore, I should erect a villa in the old English style, and in that ornate manner of it called the Elizabethan, as being most adapted to the habits of refined and peaceable times. Of the various forms of houses of which we have examples in the old English style, that of a blunt H, is, perhaps, best suited to a villa residence of the second order. Supposing, then, that our villa be in the English style, and in the form above alluded to; the front would present a centre and two projecting wings. The centre would contain the hall and dining-room, with a gallery and staircase behind them. One wing would be occupied by the drawing-room and library, with the saloon between them. The other wing might contain a sitting-room, and superior offices for servants; the inferior offices being in the basement, or in a separate building in the kitchen-court. The principal front should be highly ornamented, and form a symmetrical whole. In the centre would be the porch of two stories, with its rich gable, small pillars, escutcheons, &c.; the wall on either side (broken into compartments by pilasters, or handsome buttresses, and proper string courses) would contain large mullioned windows; the whole supporting a battlement or a parapet, with its appropriate ornaments, such as busts, urns, heraldic animals, &c. The ends of the projecting wings would present each a bay window of two stories, square or semicircular in form, with balustrade or stone covering above; the gables of the wings corresponding with that of the porch. The high and steep roof should be varied by ornamental chimneys, of different patterns, placed in their proper situations; and, rising above them, the tower containing the grand staircase, appearing at a short distance behind the porch; its wavy cupola roof terminating in a rich lantern, and supporting a weathercock or dwarf spire. The general effect of such a building would be dignified and imposing; the projecting wings, the high roof, the numerous chimneys, and the lofty staircase tower rising in the background, all conveying an idea of magnitude which the edifice would not in fact possess. But, however beautiful the house might be in itself, it would require the aid of certain picturesque accompaniments to connect it with the site, and to make it harmonise with the surrounding scenery.

1679. *Architectural and Gardening Accompaniments to the House.* The superior taste of our early Architects led them to enclose their ornamented edifices in a rich framework of courts and gateways, balustraded terraces, and architectural gardens; which the ruthless hand of modern improvement has swept away, as being inconsistent with the habits of more refined life. We should, however, soon learn the value of such embellishments, could we compare the effect of an Elizabethan mansion, in its ancient glory, with its present forlorn appearance, after suffering the mutilations of some levelling improver, who has robbed it of its gorgeous framework, and exposed its nakedness on a bald expanse of turf, where it frowns in sullen majesty, and communicates a gloom to all around it. Indeed, much of the gloomy effect so often observed in a handsome modern residence arises from this defect of architectural embellishment around the house; without which, I

am persuaded, no important mansion can be either picturesque or cheerful. Now, though I admit that some of the appendages to our ancient residences are inconsistent with present habits; yet there are many which might be retained without inconvenience, and with great advantage as to general effect. Thus, terraces and architectural gardens are of this description, and are particularly ornamental. At that end of the villa, therefore, which contains the drawing-room and library, with the saloon between them, I would form a spacious terrace, with a handsome balustrade supporting urns at proper intervals; the ends of the terrace in some projecting form, one of which would be seen as you approached the house, and would unite with a low ornamental wall enclosing the garden from the park. Opposite to a door in the saloon should be a flight of steps descending to the garden, across which should be a broad walk ending with a stone seat built in the garden wall, immediately opposite to the saloon door. Another principal walk should cut the above at right angles; and at the intersection I would place a marble basin and fountain: this walk should terminate at one end with a temple or conservatory in the shubbery under the hill, and at the other with a rich gateway leading to the park. The garden I would divide by broad gravel walks into squares of turf, on which should be beds of flowers and shrubs, and an urn or statue at the corner of each square. Beyond the garden, the pleasure-ground should extend behind the house to the kitchen-garden, and, communicating with walks in the woody hill which backs the whole, be a substitute for the wilderness which was the ordinary appendage to an ancient mansion house. As a substitute for the bowling-green, which was formerly indispensable, I would have a ground for archery, with its proper butts and seats; it might be made highly ornamental, and would be introduced with good effect at a short distance from the house. The remaining outward embellishment of an old residence is, perhaps, the most inconsistent with the habits of modern life: this was, a court-yard surrounded by a high wall before the principal front. Opposite to the porch was usually a handsome gateway, from which a paved walk led to the house. It appears from a drawing, still preserved, that a large court of this description was originally before the principal front of Longleat, adorned with a handsome gateway, and two fountains; and it would improve the appearance of that princely edifice if it had now something of the kind, instead of the bare turf at present before it. The objections to the court are, that it excludes the view, makes the house gloomy, and prevents a carriage-approach to the house, without which no residence can be now complete. I think, however, that this ornamental appendage might be so modified as to be no inconvenience in these respects; and propriety suggests to us that the entrance should be protected by an enclosure, from the nuisances occasioned by cattle in the park. I would, therefore, retain the court, which might be either square or semicircular. Supposing it the latter, I would enclose it with a low wall, which could be ornamented in various ways; having opposite the porch an arch, or lofty gate-piers, adorned with arms, &c. The wall might be accommodated to the height of the piers. Within the court a carriage drive should wind round a circle of turf, on which might be compartments of low shrubs, with urns or sculptures intermixed, and in the centre a fountain, or obelisk supporting a lamp. A square court might be adopted, with a gateway in two of the sides, leaving the view unbroken in front; and even a few obelisks or statues might be placed around the entrance, to vary the sameness of the level green lawn which is now a substitute for the ancient court. But, if managed as above described, the court, so far from being an inconvenience, would give a richness to the approach; the view in front would not be interrupted; and the ornamental gate piers would, in most cases, give an interest to the foreground of the landscape, which we look for in vain upon a broad expanse of turf. Assisted by these embellishments, the villa would be in keeping with the surrounding scenery. The stables and offices at one end of the house would balance the terrace and parterre at the other; and in front would be the court. The whole, if properly mingled with groups of cedars, cypress, ilex, &c., would form a composition striking even to the ignorant, and, I hope, not uninteresting to the more fastidious eye of the painter and man of taste.

1680. *The Porch*, in an old English mansion, was commonly much enriched with sculptured ornaments, heraldic devices, &c.; as I imagine, because the stranger is supposed to observe it carefully, while he is waiting to be admitted into the house. I would ascend to the porch by a flight of stone steps, to give dignity to the house, and an idea of dryness: it should be floored, as the hall, with a pavement of stone; the ceiling should also be much enriched, and the door and doorway highly ornamented, because exposed to minute examination. As you are supposed to wait for a few minutes in the porch, there should be a seat on each side, on which servants might rest while in waiting for their masters. The porch is the proper place for the door-mats; the scrapers being at the foot of the steps, and outside the porch should be a bell-pull, besides that at the court-gate; since, if the latter were rung on entering the court, the

door might be opened before the visiters reached it. The porch should be the only entrance to the house, for visiters; that from the garden terrace being confined exclusively to the use of the family, who would generally dislike to have their privacy interrupted by the sudden intrusion of strangers. These observations upon the porch are equally applicable to the Grecian portico. The porch would admit you to the entrance-hall.

1681. *The Entrance-Hall*, in regard to character and size, must depend upon the scale of the principal apartments. If the latter are spacious and elegant, the hall should be large and handsome: indeed, an old English residence would not be in good keeping without a spacious hall, as it was formerly the dining-room and place of rendezvous for the servants and, retainers; and, in a Grecian mansion, a large entrance-hall is necessary for effect. If the apartments are small, and devoid of ornament, I would then substitute for the hall a smaller kind of entrance, with a vaulted roof; and, moreover, rather gloomy, to increase the general effect of the rooms which open into it. In the old English and in the Grecian style, the hall is generally high; often reaching to the ceiling of the upper story of the building. In the English style, this should always be the case in houses of much pretension; but, in a Grecian house, a hall with a low ceiling, supported by lines of columns and pilasters, has generally the best effect. In the latter, the entrance-door should be in the middle; in the English style it should be at one end of the outer side. An English hall admits of much picturesque embellishment, such as a carved oak roof or ceiling, either flat or semicircular, enriched with highly wrought bosses or coats of arms; a music gallery across the end, supported by pillars or a carved screen; a chimney-piece reaching to the cornice of the roof, and a carved wainscot covering half the height of the walls. The decorations of a Grecian hall have more of the beautiful than the picturesque, and more grandeur of effect. Besides the columns supporting an embellished or coved ceiling, a fine effect is produced by dividing the side walls into compartments by pilasters; and having, in these compartments, handsome doorways, panels, wreaths of fruit and flowers, reliefs, busts or statues in niches, a noble chimney-piece, and other architectural embellishments. It might also have a floor of various-coloured stone or marble. A hall in the old English style should be so furnished as to have an appearance of use beyond that of a mere entrance to the other apartments: it was formerly the general eating-room, and might still be the banqueting-room on great festival occasions. The furniture of a hall in this style should be rather plain and massive; consisting of massive oak chairs and benches, a high table across the upper end, formerly placed on a platform (called the dais) raised a step above the floor, and other tables capable of being united in one upon great occasions; one to be used as a sideboard, and placed against the wall, at one end of the high table; carved chests to contain less valuable papers; window-curtains of cloth, of the simplest form; a few books, and writing implements; and a massive lamp suspended from the ceiling. The walls, painted to imitate stone, might be hung with a few of the oldest family portraits, the founder in the panel over the fireplace; and a few other pictures, such as hunting-pieces, Dutch fairs, and other amusing subjects. To assist in furnishing the walls, armour and curious specimens of defensive arms, and ancient sporting weapons, together with the horns of stags and other animals taken in the chase, might be hung around. The hall is the proper place for all sporting instruments, as guns, bows and arrows, fishing tackle, &c. There might also be a few fire-buckets hung up under the gallery; and a letter-box, with notice when the post goes and arrives, might be placed near the door. Where state is observed, the porter's staff would be an appropriate ornament, in its place, near the front door. The family arms, and the arms of those connected with the family, should be among the ornaments of the hall. They might be introduced on painted glass in the windows, on the cornice of the wainscot, on the pediment of the fireplace, in the roof, and front of the music gallery, and even on the chairs and benches. The floor should be of stone, uncovered by a carpet, unless it were a Turkey carpet placed under the high table, when the hall is used as a dining-room. To make the hall comfortable, it should be warmed with hot air, to which, on state occasions, I would add a fire of large logs of wood, burnt upon handsome dogs in the open chimney, to which there should be a back plate of cast iron, ornamented in high relief. I remember seeing a plate of this kind at Birmingham, on which was the representation of a battle in bass-relief; and a beautiful thing it was. (In the hall at Persfield near Chepstow, we have heard that cinnamon and other spices were thrown into the hall fire upon great occasions.) There should be but few doors in a hall of this kind; there were seldom more than three in old English halls; viz., the front door, and the one opposite, and the buttery-door in the middle of the lower end, all under the gallery, and shut out from the hall by the screen, which formed a sort of passage at the lower end. The hall of a Grecian house would require less furniture than a hall in the English style, as it could seldom be used for any other purpose than that of an entrance. But, to give it a furnished appearance, I would fill the vacant panels with the oldest family portraits,

the founder in the place of honour, over the fireplace, opposite the great door. Busts on pedestals, and statues, might be placed around it; armour, I believe, would be out of keeping. There should be handsome chairs and benches of carved wood, ornamented with the family arms; and marble tables on carved frames; plain cloth curtains; and lamps suspended from the roof. To these might be added a few of the articles above enumerated, such as the sporting implements, letter box, &c., for which the hall is the most convenient place. The floor should be uncovered, except, perhaps, in winter, when a few strips of India matting between the doors of the rooms would give it an appearance of comfort. It should be warmed with heated air and have a wood fire on particular occasions. In a hall of this kind there might be doors *ad libitum*, provided they were regularly placed.

1682. *The Gallery.* To return to our old English villa: having entered the porch door, you would cross the lower end of the hall to the opposite door, opening into the lower gallery, extending the whole length of the hall and dining-room, fifteen feet wide, and twelve feet high. Opposite the door by which you enter is a broad arch, through which appear the staircase, and the lower division of its painted window. The gallery windows are on the same side as the staircase; at the end, on your right, is the saloon door; and, at the opposite extremity, the door leading to the offices. The floor is of stone, like the hall, with a broad strip of India matting extending the whole length of the gallery. The walls might be painted of stone, or any sober colour, and be ornamented with the inferior pictures, and family portraits, and a few glazed prints. The ceiling might be either coved or plain. There might be a few ebony chairs and settees, with a table or two, against the side opposite the windows, which should have curtains, without draperies, of crimson cloth. At the end near the saloon door would stand the wood basket and coal scuttles; and near the same a door might lead to the billiard-room, a low building in the garden. This gallery would form a sort of promenade, and place of recreation for the children and young people in wet weather, and would be an ornamental appendage to the house: it should be warmed with hot air. The door (which should be of two leaves) at the end of the gallery should be in the centre of the side next the saloon, and should be handsome both in its proportions and decorations.

1683. *The Saloon*, which is generally a sort of vestibule to the living-rooms, might be in form either a square, a long parallelogram, an oval, or circle; but a parallelogram of good proportions is the most usual form. In the present case, I will suppose the saloon of this last form. The door, by which you enter it, being in the centre of the side next the gallery, in the centre of the end on your right would be the drawing-room door, also of two leaves: opposite to it, at the other end, should be a like door into the library. In the other side should be two windows, with a glass door between them, opening to the terrace and garden. As this arrangement of the doors would leave no proper place for a handsome chimney-piece, the room might be warmed with hot air (the best mode of heating it), or have a small fireplace on each side of the gallery door. As the saloon is often used as a music-room, we will suppose it to be so in the present case, and furnish it accordingly; and, as it is generally rather a splendid apartment, I would attempt to render it something of the kind in this instance. The walls I would divide into rich panels, in which might be some of the full-length portraits of the family, or which might be filled with fresco paintings upon the walls; and the divisions between the panels should be painted with wreaths, including musical emblems. The doors should be of oak in frames, painted like the walls. Above a rich cornice, the ceiling should take the form of a half cove, leaving a compartment in the centre. In the coved part, over each door, might be painted groups of figures; or the family arms might be introduced, surrounded by wreaths of flowers, musical instruments, &c. The corners also might be painted in the same style. In the centre of the middle compartment of the ceiling, from a rich boss, should be suspended a handsome lamp, and the boss might be surrounded by a group of figures. A warm fawn colour might be the ground of the whole painting, and a good deal of gilding might be introduced in the cornices and mouldings. A saloon requires but little furniture, and, when used as a music-room, should have none that is calculated to deaden sound. Modern ideas of comfort, however, make a carpet and curtains indispensable. The carpet should be of thin material, covering great part of the room, but showing about a yard all round it of the polished oak boards. It should, of course, be a bordered carpet; the colour of the ground a shade of fawn; the pattern chiefly shades of crimson. The curtains I would have of crimson watered silk, without draperies, supported by large rods of gilt brass, with handsome knobs. The chairs and seats should be without cushions, and of rather a plain description, so as not to interfere with the splendid effect of the drawing-room. I would have the chairs of ebony, or an imitation; and there are old carved ebony chairs which might be taken as a pattern. The seats might be of cane, gilt. I would have

seats of various forms: a few arm-chairs; chairs without arms; long benches, supported by twisted legs and frames, such as are met with in old galleries, and stools. Against the piers, between the windows and door to the terrace, might be slabs of dark-coloured marble, supported by carved rosewood frames; and, in the corners of the room, rosewood tripods, slightly gilt, supporting china vases of flowers. I would also have two plain rosewood tables standing against the wall; on one of which the flat chamber-candlesticks might be placed at night, one of the candles being lighted: the other table would be useful for the servants to place any thing upon; such as the tea-tray, while the drawing-room door was opening, &c. The musical instruments and music-stands would complete the furniture of the saloon. The grand piano-forte should be placed not close to the wall, say between the library door and the window, so that the back of the performer should be to the light. The harp would be at the opposite end of the room; the other instruments, in their cases, on a proper stand against the wall; and the music stools and stands so placed as to leave the centre of the saloon open, so as to have a free passage between the drawing-room, library, and gallery. In arranging the contents of the room, a crowded effect of furniture is to be especially avoided, as being at variance with an air of dignity and elegance which is proper to the saloon.

1684. *The Drawing-room.* We next proceed to the drawing-room, which, being the sitting-apartment of the ladies, should be distinguished by the elegance of its proportions, decorations, and furniture. Though two drawing-rooms are necessary in a London house, one will be found sufficient in an ordinary country residence, containing a saloon and library; as the latter would be used as the family sitting-room on common occasions. Our villa would, therefore, contain only one drawing-room, which I shall proceed to describe. The drawing-room should be larger than the saloon. In the present case, we will suppose it to be 23 feet in width and 35 feet long, exclusive of a bay at the end, and at least 12 feet high. This would make the proportions nearly equal to those which, according to Palladio, are proper for a room of this description; viz., the length twice the breadth, and the height two thirds, five sevenths, or three fourths of the breadth. Entering our drawing-room from the saloon, at the end opposite would be a square or circular bay window, commanding a view of the park and the distant country beyond it. On the right side would be the fireplace, and on the opposite side two windows looking over the terrace and parterre. In this room I would have a splendid white marble chimney-piece, copied from one of the most magnificent designs common in old English houses. These are usually of stone or coloured marble: but white is the most elegant, and most in accordance with our present taste. I have one in my eye which reaches to the ceiling, and is divided into two compartments. In the lower compartment is the fireplace, surrounded by a broad moulding, and on each side double Corinthian columns, supported by ornamented pedestals. Above this is a broad cornice which forms the mantel shelf, and the base of the upper division; the middle of which has a panel surrounded by a rich moulding, the centre filled with projecting heads, and a large basket of fruit and flowers, in high relief. On each side are double Corinthian columns, similar to those below, but having a sort of niche between them. The whole is finished above by a handsome cornice, ornamented with shields and fruit. A chimney-piece, of this design, of white marble, with coloured shafts to the columns, say verd antique or scagliola, with a historical subject in alto relievo filling the panel over the fireplace, would have an elegant effect. Gilding might be sparingly introduced in the capitals and cornices, and the shields might be painted with the family arms. All the woodwork of the room should be unpainted, say polished oak. The panels of the doors and shutters should be copied from handsome old wainscot, and the mouldings partially gilt. The ceiling should be a specimen of that gorgeous lacework, in stucco, common in old houses, with ornamental pendants to support the lamps, and varied with shields of arms, the whole tinted to suit the colour of the walls, and partially gilded. As I do not pretend to any taste in colours, indeed cannot correctly discriminate their various shades, I should be rather at a loss in selecting the prevailing colour of the drawing-room furniture. I think dark colours have most dignity of effect in furniture; and perhaps light colours most elegance. Of dark colours, crimson is the richest, and is the prevailing colour in modern drawing-rooms in our most splendid palaces, as it was in old houses. Orange and yellow were much chosen formerly for beds and furniture. The yellow contrasted well with the dark wainscot, and heavy style of cabinet-work common at that period; but, where yellow is the prevailing colour of the walls and furniture, the effect is usually gaudy. Generally speaking, there should be always some contrast between the colour of the walls and curtains. The drawing-rooms at Earlstoke Park were furnished with apple-green satin; the walls hung with watered rose-coloured silk; the ground colour of the carpets dark mulberry, on which were groups of flowers. There was a profusion of gilding, and the effect was strikingly elegant. As I am reserving crimson for the colour of the dining-room furniture, I really

do not know what to choose for the drawing-room; suppose, at a venture, we fix upon blue satin; I mean a pale blue, which is a good candlelight colour, and is a sort of medium between dark and light. The next difficulty is, what should be the colour of the walls: perhaps buff would do; and, as we cannot discuss the point, I will suppose the walls hung with silk of a buff colour, watered, or having satin and watered stripes alternately. Or, the walls might be formed into panels; the framework painted a very pale blue; the panels, which should be large, filled up with silk having a gilt moulding round it. If silk were merely hung upon the walls, of course it must be surrounded by a gilt moulding. Where silk or velvet is used for the furniture of a room, a papered wall has generally a poor effect; except, perhaps, a plain flock paper, which has the appearance of cloth, or a paper printed in imitation of striped or watered silk: but I should prefer a handsomely painted wall to paper, if silk curtains were to be used. In the drawing-room I would hang some of the finest pictures that were not of a large size. A small Claude, a curious portrait or historical subject, or rare cabinet picture; indeed, any beautiful picture of moderate dimensions, would here be in its proper place, provided the subject were pleasing. A few busts, or curious small sculptures, might also be introduced. I would have the fringe of the curtains blue; the draperies simple, and in large folds; the cornices massive and gilded. There should also be inner curtains of figured muslin, edged with blue silk ball fringe. In the pier between the windows should be a large looking-glass filling up the whole. Below it, a marble slab, say of Florentine mosaic, and in the gilt stand supporting it a bookcase, filled with handsome books of an amusing kind, such as the best poets and novelists, &c., and curiously embellished works. On the slab might be china vases filled with flowers. On each side of the entrance-door might be a rich inlaid cabinet, on a carved and gilt frame; under it some large jars of china; and some curious specimens of old china, arranged on a rising frame, on the top. I would have an Axminster carpet and rug, of colours suited to the furniture. The frames of the chairs and sofas might be buff or cream colour and gold. The seats covered with blue satin, edged with buff-coloured gymp (a kind of laced bordering, made of cord). The frames of some of the chairs should be carved and rather massive, and the chairs themselves should be of various kinds; such as large reposing-chairs, others with and without arms, some of a lighter kind with gilded cane seats, and others which unite into a kind of sofa against the wall. These latter might fill up the space in that end of the room which is not occupied by the bay window. There should be two sofas placed not against the wall; they usually stand on each side of the fire-place. At the end of the room, near the bow, might be a modern kind of seat, like two sofas placed back to back: persons sitting on one of the seats would look through the bay window upon the park, and before the other seat might be a sofa table, on which should be placed a handsome silver ink and taper stand, writing-cases, books of prints and drawings, and *bijouterie* of the better kinds: settees, and perhaps a table, would fill up the bay window. A large round table is usually placed in the middle of the drawing-room, on which are generally books of prints and other things to amuse the company; a china plate, made into a sort of basket, to hold visiting cards and all sorts of things; and a variety of odd matters which I cannot enumerate. Two card tables would stand one on each side the fireplace: and, besides all these, we must have tables of various sizes, some small ones on pillars; a chess table, with an inlaid marble top, the men placed upon it; a large china dish set in a gilt sort of tripod; a sort of table flower-stands; and I cannot tell what besides. Most of the tables must also have something upon them, to make them appear of use. There might be candelabra near the fireplace, or in the corners at the lower end of the room, supporting lamps. There should be screens of various kinds placed near the fire; one I would have, like the large old screens, of embroidered silk, in a carved gilt frame; and various sorts of footstools, chiefly with carved gilt frames. Writing, work, and drawing boxes of handsome kinds, and every thing amusing, curious, or ornamental, is in its place in the drawing-room; but the host of trumpery toys so often seen there would be unworthy of a place in a room like this. The arrangement of the multitudinous furniture and ornaments must be left to the taste of the lady of the house; none but a lady can do it. The chief thing to be avoided, in the disposition of the articles, is a vulgar crowded effect; every thing should seem to contribute to comfort or amusement, and there should be nothing superfluous. I had nearly forgotten an important feature in the room, viz. the grate, which should be large and low, of polished steel, with handsome back plate, showing itself above the fire. If the fire is of wood, as is sometimes the case, the dogs should be very handsome, and the back plate particularly so. The fender and fire irons might be plated. The lamps suspended from the ceiling might be also plated, or of the handsome gilt brasswork now in fashion; and I would light the room entirely with wax, to the exclusion of oil, which always produces both smoke and an unpleasant smell.

1685. *The Library.* Having now, I hope, made my escape from the drawing-room,

let us proceed across the saloon to the library. This, in form and proportions, I will suppose exactly similar to the drawing-room, having the same sort of bay window at the end opposite the door, from which is a home view over the pleasure-grounds to the rising woods behind them. The two windows opposite the fireplace would look upon the flower-garden and the church tower rising from the trees in the park. The library, though it ought to be a handsome room, should present a great contrast to the light elegance of the drawing-room. The furniture should be substantial, the hangings of a warm but dark colour. In the present instance we will choose claret or maroon colour. That part of the wall not covered by bookcases might be painted to imitate old oak wainscoting of a handsome pattern, or it might be formed into panels, filled with plain flock paper edged with a narrow beading of gold, the framework dark oak; or it might be papered with plain flock paper in the usual manner, with gilt mouldings. The colour of the paper maroon. The ceiling and cornice after some rich old pattern, with pendent ornaments to support the lamps. It should be of a heavier description than that in the drawing-room, with more numerous coats of arms blazoned in their proper colours. I should paint and pick out the ceiling with some light warm colour. The chimney-piece should be handsome, but it might be lower and heavier than in the drawing-room, and might be made of the best sorts of stone, or of British marble; for instance, Purbeck marble is a handsome material for chimney-pieces. It might contain a low arched fireplace with a rich cornice above, supported at the sides by small pillars or pilasters. In the fireplace I should have a large low grate, with a rich back-plate, on which should be a classical subject in relief, say the Destruction of Troy. The grate, or dogs for a wood fire, of dead steel, the fender of the same. The vacant walls of the side in which is the fireplace, and that of the two ends, would be covered with oak bookcases, two thirds of their height. The lower part of the cases should be enclosed by doors of brass wire, in which might be kept the more curious and valuable books, prints, drawings, &c., the shelves above being open. In the piers that divide the cases might be closets for rolls of maps, &c. On the cornice above the cases might be a series of busts of philosophers and eminent scholars; and on the wall seen above the book shelves, scripture subjects, and portraits of distinguished authors, statesmen, &c. A full-length portrait of some celebrated person, or member of the family, might be hung over the fireplace; and in the pier between the windows opposite would be a place for maps on spring rollers fixed to the wall. Below them might be a dark marble slab on a carved frame, and under the slab a sort of frame for large folio books of maps, engravings, &c. The slab might have upon it small bronze statues and things of that kind. The curtains should be of maroon-coloured merino damask, lined with glazed stuff (this sort of damask has a poor effect without a lining as it is commonly used), and trimmed with silk fringe, &c., all of the same colour. The cornices might be maroon colour and gold. I would have inner curtains of plain muslin, edged with maroon silk fringe. There should be a large Turkey carpet, or an Axminster carpet, with a maroon-coloured ground, showing round it the polished oak floor, and a hearth rug to match. The library should contain an abundance of various sorts of seats and tables, made of some dark wood, the more carved the better. There should be two or three large easy chairs, with movable desks and candlesticks, some smaller arm and other cushioned chairs, and a few light chairs with gilt cane seats. The patterns of the chairs should be old-fashioned; and some real old high-backed chairs might be introduced with very good effect. There should also be a sofa or two, and some stools and settees; the cushions of the chairs, sofas, &c., being covered with maroon-coloured leather, with silk tufts and gymp edgings. As the library would be the common family sitting-room, a round table would be necessary, for tea, &c. There should be also one or two regular library tables, with drawers, and maroon leather tops. One might be placed across the room at the end near the bow, with a settee before it; the other would stand near the window at the right hand, as you enter the room; the round table being in the centre near the fire. Besides these, there should be smaller tables of various sizes, some forming reading-desks for large and small books; others on pillars and claws, to be placed about the room. A pair of globes on a stand might occupy one corner; the library steps, shutting into a strong table, would stand in another. One or two old embroidered screens, in carved frames, and a few others, and some foot-stools, might be placed near the fire. The bay window might be fitted up as a recess for reading in, with a small reading-desk or table, and settees. I think I have noticed all the furniture of a library, except the lamps, which I would have of bronze, as most in keeping with the sober character of the apartment. As to the smaller ornaments to be placed about the room, they should be curious and interesting, and on no account frivolous. Handsome silver inkstands, a few curious fossils, or models of celebrated buildings; all sorts of writing-cases and implements, taper stands of silver, boxes of coins, old china in large jars, and any thing of these kinds, with handsome books, might decorate the tables: and, as nothing gives a room a more dismal effect than an appear-

ance of idleness, every thing should be so arranged, both here and in the drawing-room, as if the persons using the rooms had been employed in some way or other. This effect would be produced by the daily papers, and some periodical works, and open letters received in the morning, on the principal tables; and, on other tables, some of the blotting books might be open: the inkstands not thoroughly in order, with some unfinished writing and open books or portfolios, would give at least the appearance of industry. I do not recommend such foolish tricks, which are, I know, often used by idle people, who have sense enough to feel the bad taste of indolence; and in a sensible family, who spent their time rationally, this would be, in fact, the usual state of the room, at least during the morning. I do not think that drawings and drawing implements would be out of their place in a library. The ladies would generally draw; and every country gentleman ought to have some knowledge at least of architectural drawing, so as to be able to design the buildings to be erected upon his estate, which are now often built from the coarse plans of ignorant workmen. Drawing would also add to the in-door amusements of a country gentleman; it would give him a taste for the picturesque, and enable him to improve judiciously his park and grounds, and understand the beauties of the natural scenery around his place. It would also open to him a source of innocent enjoyment, by giving him a taste for the fine arts, which every gentleman should patronise as far as his income will permit. But to return from this digression to the suite of living-apartments. When there is company in the house, the library would be the morning sitting-room for the gentlemen, who might here read the papers and new publications, write and answer letters; and thus, with a stroll round the garden or farm, and a look into the stables and kennels, employ the time till luncheon, after which some would join the ladies in an excursion on horseback, while others rode with their host to see some improvements upon the farm or estate. In the sporting season, those who are sportsmen would be of course engaged in the sports of the field. The ladies would occupy the drawing-room and saloon, and there amuse themselves, some with needlework, others with a book or a drawing, others with writing or music, till they met the gentlemen at luncheon; and afterwards the equestrians would probably ride with the gentlemen, while the rest took a carriage airing, or made calls with the lady of the house. This would be a frequent arrangement for the morning; but, of course, it would be varied as much as possible. Sometimes the whole party would make an excursion in carriages, and on horseback, to view something interesting, or make a visit at a distance; at other times the ladies would take walking exercise in the park and gardens, or visit the schools and cottages in the village, as the weather and inclination might suggest. After luncheon, and in summer evenings, the doors of the living-rooms would be thrown open; and on the return of the party, they would, probably, arrange themselves in groups in each of the rooms. Thus, in the library, a gentleman may, perhaps, be referring to a book, while he explains something to the ladies with whom he had conversed during the morning ride. In the saloon a lady is, perhaps, playing a lively air, while the young ladies and some of the gentlemen are lounging about the room engaged in playful conversation. In the drawing-room would most likely be another group, some sitting upon a couch, while others stood round the table collecting their work, books, or drawings, before they retire to dress; and all talking over the place or people they had visited in the morning. While we have them in these positions, let me ask what you think of the general effect of the sitting-rooms now seen together through the open doors. Stand for a moment near the bay window at the end of the library, and look at the perspective view of the whole, terminating in the distant prospect seen through the opposite bay window in the drawing-room. I hope the effect is not disagreeable; but, we cannot wait to speak of its merits or defects: the half-hour bell has rung, the ladies are hurrying to their dressing-rooms; and, as the gentlemen slowly follow, let us take a look at the dining-room, while the party are engaged at the toilette.

1686. *The Dining-room.* To get to the dining-room we must proceed through the saloon and lower gallery into the hall, where a door of two leaves in the centre of the lower end admits you to the room. Here I would have double doors. We will suppose the room of the same width as the hall, but six or eight feet shorter. The walls covered with old oak wainscot; the ceiling rising from them with a slight cove to the flat compartment, which would be formed into panels of various shapes by rather heavy mouldings of stucco. Scattered over the whole would be groups of fruit and flowers, shields of arms, and three pendent ornaments to support bronze or gilt lamps. The coved part of the ceiling should be also richly adorned with devices in stucco: a large shield of the family arms would be an appropriate ornament for the centre of each side, surrounded by emblems of hospitality. The wainscot should have a broad handsome cornice round the upper part of it, and might be covered nearly with pictures in handsome gold frames, of any subject (except, perhaps, scripture pieces), such as portraits, landscapes, historical pictures, amusing subjects, and pictures of feasts. The chimney-piece should be very

handsome. I would have it reaching to the ceiling, and somewhat resembling that in the drawing-room; but of coloured stone or marble: above the large low arch for the fireplace, a panel containing the representation of a feast, sculptured in white marble in relief; the ornaments, chiefly fruit, and emblems of hospitality. Here I would always burn wood in large logs. The dogs for this purpose should be massive dead steel, the back plate particularly handsome. The curtains in this room should be of crimson velvet, trimmed with gold lace and fringe, the cornices carved and gilt. The furniture would consist of a handsome carved mahogany sideboard on each side of the door, supported by piers, in which are plate-warmers, and a hot closet lined with tin; also another closet, which would be of use for some purpose; and under each a sarcophagus, one of them lined with lead to contain ice to cool liquors; the other would be of the same sort, to contain the beer jugs, or it might be a cellaret. A lamp over each sideboard might hang from a supporter in the wainscot. On the sideboards would be placed, at dinner time, the useful and ornamental plate and glass; and near the sideboards, against the walls, might be, perhaps, two side tables, one on each side of the room. One might be a hot table, on which to put the vegetables, &c., during dinner; the other for cold meat, and the things usually kept upon the side table. A handsome wide dining-table would stand in the centre of the floor; and a table to place before the fire when the ladies have left the room after dinner, would stand against the wall at the end of the room. This table is usually in the form of a horseshoe, and is furnished with a sort of box, to protect the bottles from the heat of the fire, which moves by a brass apparatus, or in a groove, from one person to another. A brass rod supported on the side of the table next the fire is hung with silk curtains, to be drawn occasionally as a screen. Some of these horseshoe tables can have the centre of the horseshoe filled up, and will thus form fireside dining-tables for very cold weather. Against the pier, between the windows, a marble slab might be supported on a carved frame: it would be useful at dinner-time, and help to furnish the room. The side tables are also frequently of marble, on frames carved with the family arms, &c. The chairs should be very handsome, massive, and without arms; the seats crimson leather, with silk tufts, and gymp edging. A crimson leather easy chair would be well placed on each side of the fire. Dumb waiters, with a japanned frame for clean and dirty plates, and knives and forks, besides the usual shelves, might be wanted occasionally, and would furnish two corners of the room. The floor might be covered with a Turkey carpet, showing round it some of the polished oak floor, with a rug of the same pattern as the carpet. A footstool or two might be useful after dinner. I do not remember any other necessary article of furniture for the dining-room; but, there is a certain convenience rather indispensable, viz. a closet to hold utensils sometimes required by gentlemen after dinner. This closet might be made in the thick outer wall, large enough for a person to stand in, with shelves in the corners for the utensils. A part of the wainscot might open as the door, contrived so as not to be observed. Near the sideboard a similar door in the wainscot might be formed, through which the servants might pass at dinner time, without opening the principal door at the bottom of the room. In the plan we have in view, there would be another wainscot door leading to the master's private or business room. Unless in very large houses, it is usual to take every meal in the dining-room, except tea. A regular breakfast-room is not, therefore, generally necessary in a house of moderate size; and it is desirable, on many accounts, to have no more sitting-rooms than those which are in constant use. I shall, therefore, omit a description of the breakfast-room, and proceed to the gentleman's private sitting-room, without which the country residence of a person of property would be very incomplete.

1687. *Gentleman's Study, or Business Room.* A gentleman of studious habits would use his private room as a study; and here, also, he will see persons on business, and administer justice, if he happens to be in the commission of the peace. The private room should, therefore, be apart from the family sitting-rooms, and near to the back entrance and the servants' offices, for the convenience of admitting people who come on business, without interruption to the family. It should be a comfortable apartment, of good size, but not a handsome one. The furniture should be neat and simple. The curtains might be of moreen; and the chairs, and tables, and carpet, of any unexpensive kinds. The walls might be papered with any cheap paper; and the woodwork would probably be painted oak colour, to hide dirt. Against the wall might be hung portraits of favourite horses, cattle, or dogs; and any glazed prints. There should be, of course, a bookcase, with a good collection of books of a general kind, including law books; the best publications upon farming, building, planting, gardening, and other subjects of rural economy. Some of these might be lent out to persons living on the estate. Under the cases should be a range of presses, in which to keep papers and accounts; and an iron closet for deeds of value, &c., built into the wall. A large map of the estate upon a spring roller, and a map of the county, would be often useful. There should also be a bureau with drawers under it, a large library table also having drawers, and one or two

large leather easy chairs. A washing-stand which shuts up would be also required here occasionally, and a neat wardrobe also, if the gentleman used it as a dressing-room, which is sometimes the case.

1688. *Principal Staircase.* Having now gone through the principal apartments on the ground floor, the next thing to be considered is the great staircase, which will lead us to the bed-rooms. I have already supposed the staircase to be in a separate tower, built out behind the centre of the gallery, from which you approach it under a broad handsome arch. When you are within the arch, on the right and left, under the landing of the stairs, are the doors of the gentlemen's water-closets; those for the ladies are above, and are approached from the landing-place over. The staircase is an important convenience in every house, and it should always be a striking feature in a mansion of any elegance. The tower, which I suppose to contain the staircase, would be square as high as the ceiling of the upper floor, where it would take a sort of octagon form; the roof coved, and ending in a lantern: in the centre of the lantern a boss would support a lamp. In the side, opposite to the arch by which you enter, would be a tall mullioned window, filled with stained glass. Advancing a few steps, you would reach the first flight in the middle of the tower, and ascend to the first landing-place; you would find a flight of stairs on the right and left leading to the second landing, in the centre of which is the upper gallery-door, immediately over the arch below. As the house is to be in the old English style, the stairs might be either of oak or stone; but the balusters must be of oak handsomely carved, and rather heavy. They might begin at the foot of the stairs with a richly carved sort of pedestal, and the same at each corner as they ascend. In old staircases, there was frequently an animal of some sort sculptured in wood, supporting the family arms placed on these pedestals, especially at the foot of the stairs; or the animal had a substitute in a ball or pine-apple. The centre part of the stairs might be carpeted or not; the walls of the tower might be painted like the lower gallery, and on the right and left walls a large picture on any subject would be very ornamental: for instance, a large scripture piece on each of the side walls would be well lighted from the lantern above.

1689. *The Upper Gallery.* From the upper landing, an arched doorway would admit you to the upper gallery, of the same dimensions as the one below, but not so high. The windows should be on the same side as the staircase, and the wall opposite should have doors leading to the bed-rooms and dressing-rooms. The walls should be painted like the lower gallery; and as there would be little space for pictures, a collection of glazed prints might be arranged upon the vacant spaces in the walls. I should carpet the floor; and a few side-tables and settees would be all the furniture required, except lamps suspended from the ceiling, to light the gallery at night. There might be also crimson cloth window-curtains, on large brass rods, without drapery. The collection of fossils, or old china, might be placed in glass cases between the windows. This gallery, besides its use as an entrance to the bed-rooms, would be a promenade, or place of recreation, for the ladies and young people in wet weather. As there would be a great many doors in the gallery, it would be convenient to have them numbered: the number on a brass or japanned circle over each. I have known strangers much plagued to find their rooms in large houses, for want of a proper mark upon the doors.

1690. *Bed-rooms and Dressing-rooms.* The doors of most of the bed-rooms and dressing-rooms should open into the upper gallery, or communicate with it. Generally speaking, I would not have the bed-rooms of a very large size. Twenty or eighteen feet square is a comfortable size for a room to contain a large four-post bed; sixteen feet square is sufficient for a bed-room for a single person. A dressing-room should be attached to all the principal bed-rooms; I believe modern luxury, in great houses, requires two: this would not be necessary in a villa of the second class; but even in this I would have two dressing-rooms to the state bedchamber, as, occasionally, persons accustomed to such luxuries might visit at the house. Generally, however, one dressing-room would be sufficient for the company-rooms; but if the gentleman of the house did not dress in his private apartment, I would have two dressing-rooms to his bed-room, that for the lady rather large and elegant, as she would probably use it occasionally as her private sitting-room. The family bedchambers might be at that end of the house where the offices are situated; those for company over the principal apartments. In large houses, the master and mistress frequently have their bed and dressing-rooms upon the ground floor; but I should prefer the floor above, as being more airy and quiet. A bedchamber should be an airy, cheerful-looking apartment, rather elegantly furnished, but in a plainer style than the living-rooms. The walls look best when papered; the doors and woodwork painted to suit the paper; the ceiling plain; the chimney-piece rather plain, of marble or stone; and the grates such as are easily cleaned. I should prefer a floor that could be washed; that is, not a polished oak floor, and would not have the whole covered with carpet In all the company rooms I would have four-post beds, double

or single beds according to the size of the rooms. Four-post beds are most airy and comfortable; and I have seen single four-post beds of a very elegant appearance. The bed and window curtains should be of silk, woollen stuff, chintz, dimity, or printed calico, according to the fortune or taste of the owner. For beds used by the family, perhaps printed calico or dimity furniture is best, as it may be occasionally cleaned or washed. There is room for the exercise of much taste in the hangings of beds, both in the choice of the colour and material, and in the disposition of the hangings. In the houses of great personages, bed furniture was formerly of a very costly description, and made of such stout materials that in many cases the hangings have lasted through several generations to the present time. At Boughton House, in Northamptonshire (formerly the seat of the Montagues), there were, a few years ago, some curious specimens of ancient bed furniture, of considerable antiquity, and much timeworn, but originally of great splendour. Some of these hangings were of a sort of stag velvet, others silk, or some other costly material, embroidered with coloured silk. The testers were generally rather low, and the valances put on plain, but cut into a form at the lower edges. Though simple, the effect of these beds was dignified, but rather gloomy. They were often surmounted by plumes of feathers; and many such beds are still preserved in old mansion-houses. A bed of rather more modern date than those at Boughton may be seen in the state apartments at Warwick Castle, put up, I think, for Queen Anne, and in good preservation. Our modern cheap stuffs are not likely to last so long. I have often slept, in a house which once belonged to a family much attached to the Stuarts, in a bed which was said to have been put up for the young Pretender. The furniture was of fine woollen plaid, of a scarlet ground. The valances were put on plain, but cut into elegant forms, and ornamented with silk binding, sewn on in a very elaborate pattern; and in the same way the appearance of a rich head board was given by binding, sewn on at the head of the bed. The cornice was particularly elegant, cut into the form of the prince's feathers, and other devices, and covered with plaid: the effect of the whole was very handsome and cheerful. A rich modern material for the company beds, in a gentleman's residence, is merino damask, which, if lined with glazed stuff of the same colour, would have rather a handsome effect, and look well in almost any colour. Besides the bed, the furniture of the room consists of bed-steps, containing a night-stool and pot-closet, on each side of the bed; carpets, and a hearth-rug before the fire; a neat coal-box, with a cover; a sufficient number of light chairs, a large easy-chair, and a dressing-stool. A large dressing-table, and swing glass; a washing-table, with the necessary basins, jugs, and glasses; a wardrobe, and a sort of box for caps and bonnets, which is made an ornamental piece of furniture, and a cabinet of any kind for trinkets, papers, &c. A small table on which to place books, writing implements, &c., and footstools and screens, are also necessary comforts in well furnished rooms; and, in gentlemen's rooms, a boot-rack and boot-jack. Of course, there should be every article used for washing the person, as bidets, feet-pans, water-bottles, and glasses, &c. A few pictures or glazed prints upon the walls would add to the cheerful appearance of the room. Window-curtains and blinds are indispensable; and a small clothes horse or two, for airing linen, drying towels, &c. A closet in a bed-room is convenient, in which to put away trunks and boxes, and other unsightly necessaries. A door in the bed-room should open into the dressing-room, which should be furnished to match the apartment to which it is attached. A complete dressing-room, besides what is necessary for washing and dressing, already enumerated in the bed-room, should have some other articles of furniture used in sitting-rooms: for example, a sofa, which could be made into a bed; a large easy-chair; a sofa-table; a bookcase, containing a small collection of instructive and amusing books; and a chiffonnier (literally a ragcase, used for placing books or papers in): a few pictures and prints might decorate the walls. The floor might be covered entirely with carpet; the chairs might have cushions. In an elegant dressing-room for a lady are usually work-tables and a full-length swing dressing-glass, and many useful and ornamental articles in plate and china, as inkstands, toilette suite, scent pots, caudle service, &c. &c. Of course, there must be what is necessary for containing wearing apparel, as wardrobes, cap-boxes, &c. A cabinet to contain jewel-boxes and small valuables may be also added. There should be a fireplace in every dressing-room, and a door communicating with the passage, or gallery.

1691. *The Sitting and Sleeping Nurseries* should be on the bed-room floor, and in a retired part of the house: they should be light airy apartments, with fireplaces in each. It is unnecessary to describe their furniture, which should be plain and strong.

1692. *The Governess's Sitting-room*, furnished like any other sitting-room, is usually on the first floor, and should be in a quiet part of the house.

1693. *The Servants' Bed-rooms* are commonly on the highest floor, approached by the back staircase; the men-servants' rooms should, if possible, be apart from those of the

females. The rooms for the under servants might contain two beds each, with curtains of woollen stuff. The furniture should include every thing necessary for cleanliness and comfort, of a plain and stout kind. The upper servants should have each a separate bed-room, neatly and comfortably furnished; and there should be a sufficient number of similar rooms for the servants of visiters, the males and females apart. The bed-rooms of the upper servants should be near those of the inferiors. I should choose to have plaster floors, such as are common in the north of England; and woollen bed-curtains in all the servants' rooms, to prevent accidents from fire. These floors, when kept clean, and whitened with pipeclay, have a very neat and comfortable appearance; more so, indeed, than the coarse wooden floors usual in servants' rooms.

1694. *The Housemaid's Closet* is a necessary convenience in the upper part of a gentleman's house: in this closet are kept the pails, brooms, dusters, &c., used in cleaning the house. It should be a light roomy closet, with a plaster floor, containing an inner closet for the bed-room night lamps, or rushlight cases, &c., with drawers under for cloths and dusters. There should be pegs and shelves, on which to put any thing out of the way. As warm water is much used by the housemaids, their closet, in a large house, should contain a small copper for heating water; and, if possible, it should be supplied with water by a leaden pipe, say from a cistern of rain-water upon the roof; a sink-stone, communicating with a drain, would also be a great convenience in this closet. In large establishments, the labour of carrying up and down the clean and dirty water is very great; so that a pipe supplying soft water, and a sink for the slops, is necessary in a place of this kind, which should also contain a large box, in one corner, for a supply of coals to be used in the upper part of the house. Another closet, apart from the housemaid's closet, would be also useful to contain spare bedding, blankets, and other things of the kind, when not in use.

1695. *A Bath-room* is a cheap and useful luxury, which would be considered by many persons an indispensable requisite in a perfect villa. A room of moderate size would contain the warm and shower baths; the cold bath would be in the park, in an ornamental building on the side of the stream. I would place the bath-room in such a situation that it could be supplied with hot water from the offices, by means of a pipe connected with the boiler, say in the kitchen or scullery. There should also be a supply of cold water by another pipe, and a drain to convey away the waste water. Where the house is supplied with water from a spring in some of the high ground adjacent, as is often the case, the bath-room and housemaid's closet might easily be furnished with an abundance of water. The bath-room would be most conveniently placed near the family sleeping-rooms.

1696. *Servants' Offices.* Having now, I believe, noticed what requires attention in the upper floors, let us descend, by the back stairs, to the servants' offices; of which, the first to be described is the housekeeper's room, with its appurtenances; viz., the still-room, store, and china closets.

1697. *The Housekeeper's Room* should be a spacious comfortable apartment, furnished as a respectable parlour; and so situated that the other offices may be easily overlooked by the housekeeper. The furniture should comprise all that is necessary for use and comfort, in rather a plain way. The walls might be stencilled, or covered with a cheap paper, and ornamented with a few prints. There might be plain window-curtains, a carpet covering part of the floor, some mahogany chairs, a dining-table that could be enlarged at pleasure, a Pembroke table, and a good-sized side-table. There should be a small looking-glass against the wall; the chimney-piece plain; the grate black, with large hobs. A bureau, in which to keep account-books, &c., with drawers under, and a small bookcase above, containing some instructive books, would be a very useful piece of furniture here. On one side of the room should be a row of neat lock-up closets painted; one of which should be a wardrobe for the house-linen; another for cakes and such things; and one for the tea-china and dessert-service in use, and other things of the kind. Here would also be the butler's writing-desk, and place for his accounts. Inkstands, and other useful small articles, would help to furnish out the room.

1698. *The Still-room.* A door in the housekeeper's room should open into the still-room, in which the housekeeper, assisted by the still-room maid, would make preserves, cakes, &c.; it would also be the common sitting-room of the under female servants. It should be furnished as a better kind of kitchen, containing a fireplace, with boiler, a small oven, a range of charcoal-stoves, with a cover; a small shut-up sink, with a water-pipe for a supply of water. A range of small closets for the maids, to keep their tea-things, and tea and sugar, and things used at the housekeeper's table; a large table, with drawers, in the centre of the room, and a smaller round table for work; and a dresser against the wall, to let down when not in use, would be convenient: shelves would also be useful for the pans, &c., used by the housekeeper. There should be also a roller for a round towel, and a basin in the sink for washing hands; a small looking-glass might

promote tidiness of person, and a piece of common carpet would add to the comfort of the room. The chairs and stools should be neat and substantial; and a small case of well-chosen books should hang against the wall.

1699. *The Store-closet* should be dry and airy, and it should open conveniently into the still-room, in which the stores might be unpacked before they were put away, and given out as wanted by the housekeeper. The store-closet should be properly furnished with shelves, drawers, and pegs, to receive all the stores and preserves, &c., under the housekeeper's care, which should be arranged in proper order, so that every thing might be found immediately, when it happened to be wanted. It might be kept dry in winter by a small pipe of hot air or water, from the still-room fireplace.

1700. *The China-closet.* Where the collection of china is not large, a proper place might be made for it in the store-room; but where a china-closet is required, it should be near the housekeeper's-room, and be furnished with shelves to receive the spare china and glass, and a table on which to place it when given out and returned. It should be a dry closet, and light.

1701. *The Butler's Pantry.* The next office to be considered is the butler's pantry. In the case of a large establishment, this should be a light spacious room, with a fireplace in it, or stove. The door and window-shutters should be strong; and the floor boarded. The furniture would consist of a strong table and some chairs; a long sort of dresser, with several drawers under it: at one end a part of the top of the dresser should open to a sink, lined with lead, and supplied with water by a pipe. A wash-hand stand would be necessary, and pegs on which to hang hats, coats, aprons, &c., and a boot-jack and place for shoes and boots would be perhaps convenient. There should also be a stand in which to put away the trays, and a common tray-stand, and proper convenience for draining decanters. A napkin-press is generally found here, and under it a chest of drawers for tablecloths and napkins. Against the wall should be spacious closets for glass and china and lamps, drawers for knives and forks; the latter lined with baize. An indispensable requisite here is a roomy fire-proof plate closet, in the lower part of which would stand the chests of plate not in common use, and above should be shelves and conveniences lined with baize, to receive the silver articles used by the family. To this closet I would have double doors; one of them of iron, to be closed and locked at night. The doors should have different locks, the key of the iron door to be in the sole keeping of the butler. As, for security, a man-servant often sleeps in the pantry, there should be for this purpose a closet bed complete: a round towel roller and pot closet would be also necessary. A plain lamp should hang from the ceiling, and a small looking-glass near the window against the wall. It would be convenient to place this pantry near the housekeeper's room, and out of the way of the back entrance to the house.

1702. *The Servants' Hall* should be near the back entrance; and so situated that strangers might pass to and from it without intruding upon the other offices. The size of the servants' hall will depend upon the nature of the establishment and the number of domestics kept. Here all the under servants would dine, and it would be the common sitting-room for the males. It should, therefore, be rather a large apartment, and I would have it, if possible, a cheerful and comfortable one, with plenty of light. It should have a stone floor, and a good large fireplace; or perhaps a stove would make it warmer, with less expense of fuel. The furniture of a servants' hall is very simple. It consists of a long stout oak table, generally placed rather on one side of the room, with strong benches on each side. This table the servants use for dinner and their other meals. There is generally a large chair at one end, for the servant who presides. There should also be a sort of side-table, and a small movable table, a few chairs and small benches. A large high-backed settee, with drawers under the seat, near the fire, might be so placed as to screen the fireplace from the draught of air from the door. Against the wall should be rows of pegs for the servants' hats, &c., and there should also be a roomy closet, in which to keep the jugs, drinking-horns, knives and forks, and many other things used by the servants. A dial-clock would be useful, and a lamp hanging from the ceiling, to light the room at night. In a conspicuous place upon the wall, the rules of the house to be observed by the servants are frequently hung up: there should also be a small case of useful and instructive books. A horse for brushing coats on, or to hang a great-coat upon to dry, would be useful in the servants' hall.

1703. *Men's Washing and Dressing Closet.* Where many men-servants are kept, a necessary appendage is a small room, adjoining the servants' hall, for them to wash and dress in. It should have fixed washing-places, with a pipe to supply them with water, and a drain to convey away the dirty water. It should have round towels, a small looking-glass or two, and a large press in which to put things away; also a horse on which to brush clothes. In small establishments, a corner washing-stand, such as is described at page 292, might be placed in the servants' hall, with a cover to conceal it when not in use. It should be supplied with water by a pipe, so that it could be used at any time, and a towel should

hang on a roller near it. A small leaden box, with holes in the bottom, might be fixed in a corner of the washing-place, to contain the soap. I would on every account encourage cleanliness among the servants; and they would have no excuse for being dirty, if proper conveniences for washing were provided.

1704. *The Knife and Shoe Cleaning Place* should not be far distant from the servants' hall; and would, of course, contain the necessary conveniences for cleaning knives and shoes, which it is unnecessary to describe.

1705. *The Kitchen* is one of the most important offices in a house; and is often, in large residences, a very handsome apartment. I remember to have seen one, at a nobleman's house in Warwickshire, which struck me particularly. The kitchen, scullery, larder &c., formed a range of building on one side of the kitchen-court, separate from the house, but there was a covered way between them. The building was of two stories, the kitchen occupying the centre. It was a large lofty room, of good proportions, as high as two stories of the building. You entered it at one end, by large folding-doors, from a passage through the building; at the opposite end was the fireplace with the screen before it; on one side of which was the door to the scullery and bakehouse, on the other side a range of set coppers of different sizes. On one side of the room were two rows of windows, and under the lower row a range of charcoal stoves and hot plates: the latter to keep things warm. The other side had only the upper row of windows, and against the wall was a dresser, above which the copper cooking utensils, &c., were ranged in a very ornamental way. A long table was in the centre of the room, and over the door a dial-clock. The ceiling had a very handsome cornice, and a boss in the centre, from which hung a brass lamp. Opposite the entrance door, another door admitted you to a passage, on one side of which were the larders, on the other salting-rooms, &c.; and at the end a staircase led to the cook's apartments over. There was a sort of turret on the centre of the roof, containing a capital clock, which struck upon the dinner bell. The other offices were in the basement story of the mansion, and the kitchen was detached, to prevent the annoyance of the smell of cooking, which commonly ascends from a kitchen beneath the house. I thought the arrangement particularly convenient, and the kitchen was really an elegant apartment. As, in a large establishment, there is cooking going on through the whole day, it is of importance to the comfort of the family, to place the kitchen in such a situation that the smell of cooking, which is particularly offensive, may not be an annoyance to the principal apartments. A house with the kitchen in the basement story is generally subject to this inconvenience, and it is usually avoided by having the kitchen and offices in a separate building adjoining the house. Underground offices are also dark and uncomfortable; and, in a country-house of any consequence, it may always be contrived to have them above ground. The kitchen described will give an idea of the principal requisites in this office, and I am not able to enter into the details. A kitchen should always be a light airy room, with the windows, if possible, looking north or east; and in no case west, where all the windows are on one side.

1706. *The Scullery.* The kitchen should open into the scullery, in which the dishes, &c., are washed, and all the dirty work done. I suppose it should contain proper sinks, a fireplace, a small brick oven and a large oven, if the bread be baked there; coppers for heating water for the use of the kitchen-maid; dressers and tables; plate-racks, shelves for saucepans, &c.; and it should be well supplied with water. It would be convenient that the scullery should have a door opening into the kitchen-court near to the coal place, to which there should be a covered way. In the houses of great personages, where a service of plate is in constant use, I believe there is commonly an office called the silver scullery, in which the plate is washed; but I am not able to describe its requisites; and it would be unnecessary in a villa of the second class.

1707. *The Larders* should be placed close to the kitchen. There are usually four offices of this kind in great houses; viz. the wet and dry larders (the former for undressed, the latter for cold meat), a game larder, and a pastry. In ordinary gentlemen's residences, a wet and a dry larder would be sufficient; to which, in the case of a large family, a small pastry might be added. Both larders should have windows, at least, on two opposite sides, and should be cool and dry. The windows should be covered with wirecloth, to exclude flies and insects; the dry larder having glass windows inside, to be shut when the weather requires it. I once saw a very pretty convenient larder, which was used only for game, but it would be a good model for an ordinary wet larder. It was built out from the wall of the kitchen, in the form of an octagon, having windows on every side, except that formed by the kitchen wall, and in this was the door. The roof projected over the windows, to protect them from the sun and rain. The ceiling in the interior was coved, and from the centre hung an octagon rack with hooks for the smaller birds all ranged in order; and round the wall was another rack for pheasants, hares, rabbits, &c. A common wet larder might be built in this form, in which the meat might hang on the rack in the centre, with the chopping-block under

The game might be hung round the wall, and under the game might be a dresser on which to cut and salt meat, and salting-troughs lined with lead, and having covers like the dresser. It should also have a machine to weigh meat as it is brought in. A dry larder is the place in which the cold dressed meat is kept. In the centre is a large table of wood or stone covered with a tablecloth, on which the cold meat is arranged in dishes. If the windows are not fly-proof, which they always should be, a sort of safe made of coarse muslin, or wire, on an arched frame, is sometimes used to cover the whole table. This might hang on a cord and pulley from the ceiling, so as to be pushed up out of the way while the cold meat is taken out. A broad dresser and a row of shelves might be placed round the dry larder, on which to make and place the pastry and other things usually kept here. (A fish larder, § 1461, and also a vegetable larder, such as we have already noticed, § 737, might be added.)

1708. *The Salting-room.* Except in very large families, a separate salting-room is seldom necessary. When required, it should be a cool place, containing proper salting-troughs of lead with covers for meat in pickle, with taps or holes in the bottom, to let off the brine; and a stone table on which to salt bacon, with a groove round it, to convey the brine by a small pipe to a vessel placed beneath it.

1709. *The Smoking-chimney, or Room for smoking Hams and other Provisions,* should be detached from the house. Its forms, &c., will be found described at length, § 739.

1710. *The Wash-house, described,* § 725; *the Laundry,* § 726; *the Brewhouses,* § 728; *and the Bakehouse,* § 727, are, of course, separate offices, and are nearly the same in all sorts of residences, varying only in size. Unless in very large establishments, a separate room for a bakehouse would seldom be required; and it would save trouble in cleaning the house, were the oven placed in the scullery, where it would be no inconvenience, as the bread for the family would seldom be baked more than once a week.

1711. *The Kitchen-Court and its Appurtenances* include the places for coals, wood, and ashes, which should be conveniently situated so as to be approached under cover. The ash-hole should be furnished with a proper screen of wire, and be so contrived that, the cinders being put in at one door, they would pass down the sloping screen to another, where they might be taken out cleared from the ashes. The ashes could be removed from under the screen, and taken away by a door in the outer wall of the kitchen-court. There should be doors of the same kind, with locks, by which the coal and wood houses might be stocked without making a litter in the court. The racks for empty bottles should be in this court, enclosed by railed doors locked; and there should be also a sort of store-place for potatoes, &c., for the use of the house; and here might be put away any unsightly articles, when not used. Privies for the servants should be in a retired corner: and a pump in the centre to wash the court, which should be paved throughout, and have proper drains, so as to be always dry and clean.

1712. *The Cellars* are very important offices; and, in a large mansion, should be extensive and convenient. Their construction and arrangement have been already given, § 713 to § 718, and recurred to in § 1462 and § 1463. The descent to the cellars should be near the butler's pantry and housekeeper's room, to be within the observation of the upper servants. There should be separate cellars for small and strong beer, one or more large cellars for the general stock of wine, and a smaller one for the wine under the care of the butler, which is taken out occasionally from the general stock under the master's inspection. There should also be a root-cellar, and a spare one in which to put hampers before they are unpacked, and other things as occasion required.

1713. *Cellar-Closets.* A closet on each side of the foot of the stairs would also be convenient. In one might be kept, in covered pans, placed each in a pan of water, the cheese in use, and in the other the butler might lock up the wine left in decanters, which is commonly spoilt when kept above ground. Another closet might probably be convenient for the use of the housekeeper or cook, such as to place ice-cream in while freezing, and other things in very hot weather.

1714. *An Ice-house* is an indispensable appendage to a villa; but its construction has been already described, § 736. The dairy would be at the farm, which I suppose to be at a distance from the house (see § 729).

1715. *The Stable Offices.* We proceed next to the stables, which should have one ornamental front, to be seen as you approach the mansion. As a villa of the size described would require extensive stabling, it would be convenient to build the stables and coach-houses in the form of a quadrangle, with a paved yard in the centre. The front to the park should have gables at the ends, resembling those of the mansion; and in the centre should be an arched gateway with a clock turret over it. The doors should all open into the yard, and be so contrived that the whole might be secure when the gates were closed at night. For greater security, a comfortable bed-room might be formed in the clock turret over the gateway, in which some of the grooms might sleep. The side of the quadrangle which formed the principal front might contain, besides the gateway.

the coach-houses and the harness and saddle rooms; the latter in the two angles. The side joining the harness-room should be occupied by the coach-horse stables, divided by a sort of open vestibule, in which a gig might be put out of the rain, or a horse rubbed down in wet weather; over this open vestibule would be a loft for hay or straw, or the granary for the horse corn. Joining to the saddle-room, the riding-horse stable would occupy another side, arranged like the coach-horse stable opposite. The remaining side would contain stabling and harness-room for visiters' horses, and loose boxes for hunters. In the centre of this side might be a passage through to the dung-yard, and in this passage the wheelbarrows would stand under cover.

1716. *A Riding-house* is a luxury seldom required by persons of moderate income; but, if it were necessary, it might be built out at right angles to the side of the stable-yard last mentioned, and be approached by the thorough passage above described. As the roof of the riding-house would probably appear above those of the stables, it should be ornamented with a lantern or cupola, for the sake of effect at a distance.

1717. *The Stable-yard* should at least have a broad pavement round the four sides, sloping from the walls to a drain; that before the coach-house wider than the rest, to wash carriages upon, or there might be a square pavement for this purpose near the pump, which I would place in the centre with a large lamp over it to light the yard, the ground having a gentle slope from the pump to the edge of the pavement before the stables. If the extent of the yard would admit of it, there might be a ring of fine loose gravel between the pavement and the pump, of sufficient width to exercise sick horses upon, or other horses in cold dirty weather; but the park would generally afford a dry sheltered situation for this purpose.

1718. *The Coach-houses* should be airy and spacious, the floors dry; in low damp situations, the floor might be of stout boards. They should also be light, that the coachman may be able to rub over the carriages in damp weather without opening the doors. A closet in one of them would be convenient to receive the brushes, leathers, sponges, &c., used for cleaning carriages; the jacks for washing the wheels would stand in the passage before mentioned, with the wheelbarrows. If the harness and saddle rooms joined the coach-houses, as they ought to do, a stove in the party wall would serve to air both; and, if the carriages were moved every day in moist weather, each would stand near the stove in its turn, and all would be constantly fit for use. If a carriage be allowed to get damp, it is soon spoiled, and is also dangerous to ride in. The coach-houses should, of course, be ceiled, and the walls plastered and coloured, or whitewashed, and be kept particularly clean and free from dust and cobwebs. There should be blinds to the windows, and, where the doors front the south or west, it would also be necessary to have blinds to the doors, to protect the carriages from the heat of the sun when the doors are open, which they always should be in dry warm weather.

1719. *The Harness and Saddle Rooms*, in large stables, should always be distinct apartments. They should be light airy rooms adjoining the stables, but, if possible, not opening into them, as the moist heat of the stable would be injurious to the saddles and harness. The harness-room should in all cases have a stove to keep it dry. The ceiling and walls should be neatly plastered and whitewashed, or coloured. Round the room, at a sufficient height from the floor, should be a row of large and small pegs, on which to hang harness, bridles, &c.; and some saddle-trees to support the saddles. From the row of pegs to the floor, the wall should be boarded, or covered with canvass painted, to keep the harness from touching the wall. A small closet, in which would be kept the brushes, leathers, &c., used in cleaning harness, would stand in one corner of the room, and a movable horse, to clean saddles upon, would occupy another corner. In the centre of the room a table with lock-up drawers would be useful, to which might be added a few strong chairs, as the stable-men sometimes sit in the harness-room in cold weather, when they happen to be unemployed. The saddle-room should be exactly like the harness-room, except that it should have more trees to support saddles, and the pegs should be such as are required to hang bridles upon, &c. Both rooms should be clean, and free from cobwebs and dust.

1720. *The Stables* should be lofty, airy and spacious, well lighted, and furnished with proper ventilators to keep up a circulation of air. There should be a wide open space behind the horses. Other arrangements are described in § 750. I believe the plan of supplying the racks with hay, through a hole in the floor of the loft above, is now generally discarded, as being prejudicial to the health of the horses. A sort of closet adjoining the stable, into which the hay is thrown down from the loft, and where it would be properly shaken before it was put into the racks, would be very convenient. To avoid having the corn bin in the stable, the corn is often kept in a bin in the loft above, from which it is let down into the stable by a wooden pipe with a small trap spout at the bottom, from which the corn may be let out at pleasure, and measured as let out, by having two traps or stoppers in the trunk, with such a space between them as will con-

tain a quarter of a peck of corn, or whatever quantity may be considered a feed. Loose boxes have been already described, § 755. One, at least, should always be reserved for sick horses.

1721. *The Kennel for Sporting Dogs* would be well situated somewhere near the stables, though, as dogs are rather noisy and unsavoury neighbours, some people would place their residence at a greater distance from the house, probably at the keeper's lodge. Their larder and kitchen are certainly great nuisances in many cases. I scarcely need describe a dog-kennel, which consists, in all cases, I believe, of sleeping-houses, with a bed against the wall raised a foot or more from the ground, and filled with straw. In front of these are yards enclosed by a wall or paling; and, in the yards, proper troughs for the food and water. The sleeping-houses and yards should both be paved, kept particularly clean, and frequently whitewashed. A stream of water should, if possible, run through the yards. Adjoining should be a room containing a chest for meal, and a set copper in which to prepare the dogs' food. A pump to supply the troughs and copper with water would also be necessary, if there were no running water near.

1722. *Back Yard for Dung, Rubbish, &c.* Behind the stable should be a yard enclosed by a wall, to contain the stable-dung, wood stacks, and refuse from the gardens and house. Here might be cisterns to receive the liquid manure from the stables and the contents of the house-drains; and here would also be the privies for the stable-men and gardeners. As I suppose this yard to be bounded on one side by the garden wall, it would form a receptacle for the rubbish from the garden; so that, all the manure produced about the premises being accumulated in one place, it might be removed, as wanted, to the farm. The fuel, and all the provender required for the stable would be brought in here, the stable-men having a proper lock-up coal-house for their allowance of fuel; and as I suppose the back entrance to the garden to be through this yard, every thing the gardener required, such as coals, earth, manure, &c., would pass this way to the garden gate. All the litter of the premises would thus be confined to the back yard, and nothing unsightly would appear about the house.

1723. *Kitchen-garden.* I shall not venture to say any thing of the arrangement of the kitchen-garden; but, with regard to its situation, as a garden wall is always an ugly object, I would place the garden in a retired sheltered spot, and endeavour to conceal it by plantations and shrubberies. The principal entrance to it should be from the pleasure-ground, by a handsome gateway. This gateway might be so designed as to appear at the extremity of a lawn or vista, and form an architectural embellishment to the grounds. In the situation we suppose, the kitchen-garden would probably be in the form of a long parallelogram, the long sides north and south. The entrance would be in the middle of the east end, and might open upon a broad gravel walk, extending the whole length of the garden, having a border for herbaceous plants on each side of it; and, beyond this border, the compartments for vegetables. At the end opposite to the entrance might be the gardener's lodge, a comfortable dwelling, showing on this side an ornamental front, with a few flower-beds, and perhaps a sundial before it. Beyond the lodge would probably be a separate enclosure for the hot-houses, stoves, pits, &c.; with the seed and store rooms, and labourers' sitting and sleeping rooms, and other necessary buildings of that kind; beyond this might be the orchard, properly enclosed. The ground for dung frames would, I suppose, be near the back entrance to the garden, which, as I have already said, would be through the yard behind the stables. To make the most of the wall for fruit trees, there might be a narrow outer garden, or slip as it is usually called, round the south and west walls.

1724. *The Pleasure-gardens* would comprise the enriched parterre before the windows of the drawing-room, saloon, and library; the pleasure-grounds reaching to the woody eminence behind, and filling the space between it and the back of the house, and the end of the parterre. In this space there would be room for great variety of effect in garden scenery; such as shaded winding walks, open glades, small lawns, &c. &c., with ornamental seats interspersed. Between the kitchen-garden wall and the woody hill would be a sheltered spot for a small winter-garden, planted with the best evergreen trees and shrubs. On a small lawn, in the centre of it, might be a few beds filled with laurustinus, mezereon, Cydónia japónica, and any early-flowering low shrubs and plants; with bulbs, such as all the varieties of crocuses, &c., in great abundance. A conservatory on the warm side of it would not be ill-placed.

1725. *In the Pleasure-grounds*, I would have very few clumps or masses of shrubs. Both trees and shrubs have generally the best effect, and attain to greater beauty of form, when scattered judiciously in groups upon turf; the groups properly connected and mixed with lower growths, so as to form a whole: what is called dotting, I would especially avoid. Masses are, however, sometimes required for boundaries, and to conceal disagreeable objects. One of the most delightful pleasure-grounds I have seen is at Packington Hall, in Warwickshire, in which I do not remember to have observed a clump,

properly so called. The surface slopes from the south and west fronts of the mansion to a lake and parklike pastures. The pleasure-ground is extensive, and has an undulating surface, which is planted with groups of trees and shrubs on the turf, forming lawns, thickets, &c. The walks through it are judiciously arranged; and, indeed, the whole is so contrived, that it appears much more extensive than it really is: it contains a variety of trees, including a group of noble cedars on the highest ground, and some ancient yews and cypresses near the house. In a bright summer evening, the view from the western terrace to the lake and rising grounds beyond it, bounded by wood, presents a beautiful natural picture. I would attempt something of this kind at the back of the villa; the principal lawn in the pleasure-ground being in front of the bay window at the end of the library, with some architectural embellishment, as a seat or temple within view. The pleasure-ground should communicate with extensive walks through the natural wood of the eminence behind the villa. These would be merely wood walks, not highly kept, with occasional openings through the trees at those points where a fine distant view, or any interesting object in the surrounding scenery, could be commanded. A few rustic seats placed at these points would be appropriate ornaments for the wood walk.

1726. *The Farm.* The next appendage to the villa, which requires attention, is the farm. Every country gentleman possessing a residence such as we have described should occupy a farm of sufficient extent to supply the family with provisions; such as meat, bread, beer, poultry, milk, butter, cheese, &c. The perfection of rural economy is to purchase nothing which the estate can be made to produce; and the advantage of this system, under judicious management, is, that you have an abundance of every thing, and a liberal style of housekeeping, at prime cost. Thus, under the system of management supposed, besides the ordinary provisions supplied by the farm, the estate generally would afford game and wildfowl; the park and the waters in it would supply venison and freshwater fish of several kinds; and the gardens and orchards all sorts of fruits and vegetables; so that there would be nothing to purchase for the house, except groceries and chandlery. I have often partaken of very elegant dinners at a house in one of the midland counties, where the table was supplied almost exclusively with home produce. We had not, perhaps, a dish of sea-fish; but we had what was much better than half-stale fish, procured from London at great expense, or from a neighbouring town when it had been, perhaps, ten days out of the water; instead of this, we had a dish of the finest carp or tench I ever met with, or probably a jack, or eels, each taken from the stew-ponds immediately before dinner, and thus eaten in the highest perfection. The meat, poultry, and game were all home produce; and, perhaps, a dish of oranges was the only foreign article at the dessert, which always presented a display of the finest sorts of forced and natural fruit. If it be said that it would be, perhaps, better economy to buy than to produce these luxuries, I answer, that, in that case, things are not well managed; and probably the owner of the place is a thoughtless idle person, who does not make himself properly acquainted with his own concerns. But, supposing it to be rather more expensive to produce than to purchase luxuries; at all events, when you produce them, you have them in great abundance; they are always ready on any sudden emergency; and, in fact, you have them much oftener than you would do, were you obliged to procure them from a dealer. Besides this, by producing, you afford employment and a comfortable maintenance to many of your dependants, who would otherwise, perhaps, be supported by the poor's rate, or be breaking stones upon the roads. But the most important reason why a country gentleman should farm to a certain extent is, that it introduces him to a knowledge of agriculture, and every thing connected with land, and thus qualifies him to superintend the management of his own estate. The produce of his own farm would enable him to form a correct judgment as to the rent he should receive from his tenants. He may try experiments, and introduce useful modern improvements among the neighbouring farmers. A knowledge of agriculture will also increase his ability to be useful as a country gentleman and justice of the peace; and will cause him to be more thought of by his neighbours, who are apt to despise those who are wholly ignorant of rural pursuits. The management of a farm is also an additional source of out-door amusement to a person residing in a retired part of the country; and it moreover adds to his weight and consequence, by increasing the number of his dependants; besides giving him a knowledge of the condition of the labouring classes, and enabling him to do them many little kindnesses, such as finding an industrious man a job when he is out of work, which he probably could not do if he did not occupy a farm. For these and other reasons, I think every country gentleman should be a farmer to a certain extent; the size of the farm to be determined by the wants of his family. But I would not have him a large farmer, because a large farm is more a source of anxiety than amusement: it would occupy too much of his time and attention; and, if not well managed, would be attended with considerable expense. I would have him also a good farmer

but not an expensive one. His object should be, to produce abundant crops by a judicious but not a costly mode of husbandry; to adapt his production to his consumption, and to have little to do with buying and selling; because in this he is at the mercy of salesmen and dealers, and would generally purchase at the highest and sell at the lowest price. To turn the park to account, he would probably be a breeder of cattle and horses for his own supply, as well as a grazier and arable farmer. He might keep a large stock both of sheep and cattle, as he would have an excellent summer run for them in the park, which I would stock hard, as it is termed, both to enliven the scene, and to keep a close turf; long rough grass being of all things most unsightly about a gentleman's place; indeed, the use of the park, as a place of recreation, in our moist climate, would depend upon the closeness of the turf.

1727. *The Farm Buildings* should be placed at an easy distance from the house, either within the boundary of the park, or contiguous to some part of it near a parish road. The farm itself would, of course, be around the buildings; and a dry gravel-walk, among the trees in the park, should be formed between it and the house. The buildings would comprise all the requisite conveniences of a complete farmery, built round a yard, having on one side of it a very pretty comfortable residence and garden for the bailiff, whose wife would superintend the dairy and poultry.

1728. *The Dairy.* As the ladies would probably take an interest in the dairy and poultry-yard, I would have both complete and ornamental. The plan you have given for a dairy, § 729, is, I am aware, the best that can be adopted; but in the present case I would, in some degree, sacrifice utility to ornamental effect, and not have the dairy entirely under ground. Let us suppose it to be a pretty cottage, sunk 3 feet into the ground, with a projecting thatched roof. At the principal entrance might be a pretty rustic porch, over the steps which descend to the passage; in which a door on the right would admit you to the dairy; the floor being paved with black and white marble in diamonds, or a mosaic pavement that would admit of being washed and occasionally flooded in hot weather. I once saw a dairy in which a spring rose into a marble basin in the centre, where the pats of butter were cooled. Round the room marble slabs might be supported on low arches; the slabs being below the level of the outer surface, on which the white milk-pans would be placed. The china cream-pots would stand in the two arched recesses at one end. From the slabs to the cornice of the coved ceiling the wall might be covered with Dutch tiles, coloured or white. A good deal of china might be introduced in the dairy, both for use and ornament; and a lady of taste might make the dairy a pretty little *bijou* to show to her visiters. A second door might open to a place where the cheese was made and pressed, or to a passage connected with the bailiff's house, in which any airy garret would do for a cheese-room. I need not add that the dairy scullery should be abundantly supplied with water, and that the whole should be properly drained; having a sink connected with the wash-vat for the waste milk and whey, and every thing as convenient for the dairy-maid as possible. It should be in a shady place, say in an open grove of trees, and might be built of flints or any rude masonry, with the roof thatched; the porch should be of unbarked trunks and boughs of trees; the door might be made to correspond with the porch, by covering it with the thick stems of ivy, in a pattern, which I have seen done with a very pretty effect.

1729. *The Farmery.* After your description of one, it will be needless to give an account of the various agricultural buildings; but one thing is indispensable in a gentleman's farm yard, and that is, a clean path around it, paved perhaps, or dry and clean at any rate, so that even ladies may inspect the whole, and look at the cattle without being over shoes in dung and dirt. Farm yards are too frequently offensively dirty places, without being necessarily so; and cleanliness should prevail in every thing connected with a gentleman's residence, even in the pigsty.

1730. *Farm-Labourers' Lodge.* As labourers expect, and perhaps justly, rather more attention to their comforts from a gentleman than from a renting farmer, I would add to the ordinary farm-buildings a small-sized room, with a fireplace, and a few benches and a table, over which I would have a bed-room, containing say two plain but comfortable beds. When labourers work at a distance from home, they usually bring their dinner with them, which they eat, in a comfortless way, in the barn, or sometimes in the stable. Had they such a room as I have described, they might light a wood fire, and warm their provisions, and thus take their meals in some sort of comfort. At haytime and harvest, and at other seasons, many labourers go a great distance for work, and are often some weeks from home. During their absence they are frequently obliged to sleep in barns, and have scarcely as many comforts as the cattle in the yard: but, in the building I have mentioned, they would have a comfortable sitting-room and bed-room, which the dairy-maid might keep clean; it might also be part of her duty to dress their provisions, and thus they would have most of the ordinary conveniences which they find at home. Where the under carters or ploughboys sleep at the farm, as they do in some countries

in miserable lofts over the stables, I would have a bed-room provided for them in the bailiff's lodge, that they might be under his inspection. Young labourers often acquire habits of drunkenness and immorality by sleeping at the farm, where they are away from the control of parents and masters; one of the many evils which have arisen to the peasantry from the system of large farms. When the land was in small farms, the young carters and ploughboys usually slept and boarded in the master's house.

1731. *The Keeper's Lodge.* I believe I have now mentioned all the usual appurtenances to a gentleman's country residence, except the keeper's lodge, which should be a pretty picturesque cottage, on a woody eminence in the park, where it would be extremely ornamental.

1732. *The Village.* I will add a few observations upon the sort of village which would contribute to the general beauty of the place. I should choose to have the village at no great distance from the house, for the sake of cheerfulness. A pretty comfortable village is always a pleasing object, and even the "rural sounds" of a village, when heard at a distance, would remove that unpleasant feeling of cheerless solitude, which is often experienced at a secluded country-house. The large mansion of a nobleman is often placed in a very retired situation, in the centre of an immense park. The numerous visiters, and the host of servants and retainers, produce a sort of bustle and cheerfulness about it, while the family is resident there; but, when silence reigns around the deserted mansion, it is commonly as cheerless as a palace in the wilderness. As I should desire, therefore, to have the villa in the immediate neighbourhood of a village for the sake of cheerfulness, I should, of course, wish it to be a pretty village; because no other can be cheerful. Now, there are several kinds of pretty villages. The effect of an irregular street of old-fashioned cottages is often highly picturesque; but I should prefer a scattered village, in which the houses are arranged in groups, as being more convenient, and generally more pleasing. Cottages crowded together in a continued row have too much of the appearance, and have in fact many of the inconveniences and nuisances, of a dirty back street in a country town. The people live too close together; if the street be narrow, the houses are dark; there is not a free circulation of air, nor space for proper drainage, and the gardens are necessarily small narrow slips, shaded by the numerous trees and hedgerows, and of course unproductive. These inconveniences are avoided, and a more cheerful effect produced, where the houses are scattered in irregular groups, and at irregular distances, on each side of the road, and around the village green; some of the farm houses, with their numerous buildings standing at a little distance in fields, and the whole embellished by the surrounding pastures and hedgerow timber. Under this arrangement you have not the nuisance of a dirty village street; the cottages are more light and cheerful; the gardens and orchards would be more extensive and more productive; and the cottage allotments, whether of arable land or pasture, might be contiguous to the houses. Supposing, then, that the approach to the park entrance of the villa was through a scattered village, we will suppose, in the first place, that a good road passes through it, wide and open, and always dry and clean. At the beginning of the village the houses would be thinly scattered on one or both sides of the road. Perhaps the first dwelling you would observe, would be a respectable farm house and buildings standing retired from the road, in a field, with a few old trees around it. A little farther on, perhaps a pretty double cottage, with its orchards and low outhouses, would stand on a gentle eminence backed by a copse; opposite to it a break in the hedgerow timber would probably let in a view with a group of cottages in the fields at a short distance. As you proceed, the groups of cottages would most likely increase in number, some close to the road, others a little removed from it, all well sheltered by hedgerows and trees; till you pass by a rude bridge over a shallow stream which crosses the village green, and runs along a rocky channel for a short distance near the road; the banks fringed with underwood. At that end of the green where the high road crosses it would be some of the village tradesmen's houses; in a retired spot, at the other end, would be a pretty building for the school; and round the whole a few scattered cottages and farm houses, and plenty of trees. A narrow road would in all probability branch off from the main road across the green, passing through the brook by a ford; the green would also be intersected by footpaths, and there would most likely be stepping-stones, or one or two rude foot-bridges over the brook: it would not be a pretty green without a few old thorns, and two or three old trees, or groups of trees, scattered over it. Of course, there would generally be a donkey or two, or perhaps two or three of the cottagers' cows, or some geese grazing on it; and there would always be children playing, and the villagers passing to and fro, to contribute to the rural effect of the scene. When the road had passed the green, the cottages would probably be less frequent, and the trees thicker in the hedgerows as you advance to the park gate, which would appear to terminate the road; which would, however, branch off to the right or left as convenience required before you reached the gate. The above is a description of hundreds of villages to be seen in all parts of

England. A person having such a village near his place would, probably, not improve it by altering the accidental arrangement of the groups of cottages; and, if these chanced to be old and picturesque, much taste and judgment would be required in rebuilding or repairing them. I should scarcely have courage to pull down a fine old specimen of a picturesque cottage, unless in a case of extreme necessity. Generally speaking, an old cottage may be so repaired and restored as to preserve the picturesque exterior, while the interior was made convenient and comfortable: but when an old cottage stands in a damp unpleasant situation, and presents an exterior too wretched and ruinous to be pleasingly picturesque, in that case it is a nuisance, and should of course be rebuilt upon a better site; a ruin of any kind, though generally a picturesque object, being never a pleasing one, when it is supposed to be the squalid habitation of a wretched fellow-creature. In rebuilding the cottages, I should use the material most prevalent in the neighbourhood, that the village might form a whole. Every district produces its proper building material: thus, in some counties, stone is the prevailing material; in others, brick; in others, chalk and flints. A mixture of houses of all these materials would only have an appearance of propriety, where all were procured in the immediate neighbourhood. Stone is generally the best and most picturesque material; and most people have taste enough to perceive the staring disagreeable effect of a new red brick cottage, when placed in contrast with old stone buildings. There is an exception to this in favour of a mixture of wooden framework, filled up with brick or plaster; this being an early mode of building, of which some specimens remain in most neighbourhoods; and such cottages are always picturesque. In the case of rebuilding a village, great judgment would be required in selecting the designs, as, however beautiful the situation might be, the pleasing effect of the whole would depend chiefly upon the style of the buildings. In selecting the designs, therefore, there are two or three things that I would especially avoid. In the first place, I would on no account have the cottages all alike; and in the second place, I would discard those fanciful comfortless dwellings which are often erected as ornamental cottages. In my opinion, a cottage should present a picturesque simple exterior, conveying an idea of internal comfort and convenience; and models of this kind are most common, I think, among our old-fashioned English cottages. I would build them chiefly in this style, beginning with that style of cottage in which wooden framework prevails, and imitating all the various kinds of picturesque houses which are suitable to cottage residences. In many cases a cottage might be rebuilt exactly as it was in its old state, and, in pulling down, some of the old parts might be sufficiently good to remain; and I should, therefore, suffer such parts to remain, and build to them when they happened to present a pleasing specimen of picturesque Architecture. If the cottages were thus managed, judiciously grouped, and properly mixed with the enclosures and timber trees, a pretty interesting village might be produced in almost any situation; but, its beauty would be greatly increased, if it chanced to stand on a well wooded varied surface, and near to the boundary of the richly wooded park of a gentleman's residence.

1733. *The Village Church.* The beauty of the village would be very incomplete without a handsome village church; and, though I describe it last in order, I consider it first in importance, and would make it the most interesting feature about the place. In all rural scenery, the towers and spires of churches generally form the most striking objects in the landscape. To a man of cultivated mind, who has resided much in the country, there is always something interesting in the appearance of a village church, in which he and the lowly rustic can both forget their cares, and worship God in peace; and where all must be laid "each in his narrow cell," when the cares and enjoyments of this life are quenched in death. But I am far from considering this as a mere matter of taste. I will suppose the owner of the villa I have described a perfect specimen of a respectable country gentleman, formed after the model of Evelyn of Wootton: a man of taste and refinement, a respectable scholar, an affectionate husband, a good father, a kind master, a considerate landlord, the true friend and general resource of his poorer neighbours, and a man of sincere and unaffected piety. A person of this character would think it a discredit to his taste and better feelings to have a comfortless dilapidated church. He would rather wish to have it a beautiful interesting edifice, worthy of the purpose to which it is devoted. We will suppose it, therefore, a fine old building, in the florid style of Gothic, preserved by his ancestors, with religious care, in its original state. As the population of the parish would be small, we will suppose the church to consist only of an ample nave and chancel, with two small transepts; and a handsome tower or spire at the west end, or over the intersection of the transepts. The windows would be small, except the great east window, and all filled with stained glass; those in the nave having old coats of arms; and in the east window a fine scripture subject. Entering the church by a rich porch at the south side, near the lower end, on your left would be the beautiful old Gothic font; over it the richly carved oak loft, for the organ, schools, and singers. Standing under the loft there would be a perspective view up the

aisle to the chancel, terminated by the east window. On each side the aisle would be old oak benches, the ends richly carved with ornamental fineals; facing you on one side of the chancel arch would be the carved oak pulpit, on the other the reading-desk. One transept would be the vestry, in which would be the stairs to the pulpit; the other transept would contain the descent to the hot air stove under the church; and the coals, &c., used about the church. I would have the chancel wainscoted with carved oak, in the manner of cathedral choirs, as high as the windows; the floor paved with marble; the ceiling of the chancel vaulted, having very rich tracery and bosses; that of the nave, oak in a rich framework, embellished with coats of arms, and supported by handsome corbels. I do not mention pews, as I would not have any in the church. The most beautiful interior of a village church I have seen, was that of one rebuilt by a peer of high rank, now deceased, and one of the most excellent of men in every relation of life. It did not contain a single pew. The peer and the peasant each sat on the same sort of seat; an open bench with a desk affixed to the back, such as are still seen in many of our old churches. Pews are comparatively a modern introduction, and often greatly disfigure a beautiful church. The churchyard should have a handsome gateway. It would probably contain a few picturesque yews or cypresses, numerous tombstones, and, perhaps, a handsome erection covering the entrance to the vault of the principal family in the parish; and the whole would acquire a secluded and rather solemn effect from the surrounding timber in the park. Such a religious edifice would be worthy of its situation; and with it I shall conclude my description of the villa and its appendages.

Sect. II. *Map of the Demesne and Park, and Ground Plan and Elevations of the House, of Beau Idéal Villa.*

1734. *The Engravings which form the subject of this section* are from drawings sent by the author of the preceding description (Selim). The map of the grounds has been very slightly altered by us, in order to vary the form of the boundary of the park, and to show, somewhat more in detail, the gardens and pleasure-grounds. The plans and elevations of the house have been kindly revised by one of the most distinguished Villa Architects of the present day, Charles Barry, Esq.

1735. *The Demesne* is shown in fig. 1435, in which *a* is the entrance court to the mansion; *b*, the kitchen-court; *c*, the stable-court; *d*, the gardener's house. On the north-west front is an ancient geometrical garden, with a straight walk to the terrace, *e*, on the side of the steep and thickly wooded hill. The upper and under sides of this terrace are supposed to be planted with evergreens and bulbs, so as to form a winter garden. There are three alcove seats on it, open to the south. The two extremities of this walk join other narrower walks, which descend to the American garden at the west end, and a botanic garden at the end opposite. In front of the drawing-room side of the mansion there is a descent from the terrace into an ancient English parterre, ornamented with statues, vases, fountains, and a sundial. The walks on the side of the wooded hill are of turf, but those in the lower parts of the grounds are chiefly of gravel. *f*, The situation of the ice-house, in a rising bank near the river, for the convenience of filling it with ice; *g*, the keeper's lodge, and dog-kennels, on rising ground, and partially concealed by wood; *h*, the deer-sheds, with hay-stacks in front, for feeding the deer during winter; *i*, a circular Grecian temple, on rising ground, seen from the house; *j* and *k*, waterfalls, seen from the house; *l*, ornamental pigeon-house; *m*, dairy-house and farmery to the mansion; *n*, entrance lodges and garden; *o*, school-house on the village green; *p*, road through the village to the turnpike; *q*, parish road, passing through the estate; *r*, farms belonging to the proprietor of the demesne; *s*, water-mill; *t*, parsonage-house, garden, and glebe; *u*, church; *v*, cottages of the village; *w*, common, for the pasturage of the cottagers' cows during summer; *x*, stone quarry; *y*, rocky copse; *z*, thick copsewood, and rising hills thickly covered with wood, intersected by green walks and grassy glades; *a'*, orchard; *b'*, sunk fence, enclosing the gardens and pleasure-ground, and changing into an iron fence where it enters the wooded hill; *c'*, a portion of the park beyond the parish road; the fence on each side of the road being either a sunk wall or ha-ha, or open iron fencing, so as to show the passengers from the house; *d'*, a hedge, allowed to remain, in order to harmonise the park with the enclosures beyond; *e'*, protruding hedges, for the same purpose; *f' f'*, two points, between which the boundary of the park is formed by an iron fence concealed in the natural copsewood; *g' g'*, walks on each side of the river, open at all times to the villagers and the public. The other walks, and the public rooms of the house, may be supposed to be open for public inspection two days in the week. *h' h'*, Continuation of enclosed country, divided into farms, and interspersed with copses, the distance rising into hills; *i'*, great public road to the metropolis; *k' k'* and *l' l'*, continuation of the estate.

1455

1435

1436

Fig. 1436 is the entrance front as seen from within the gate of the entrance court

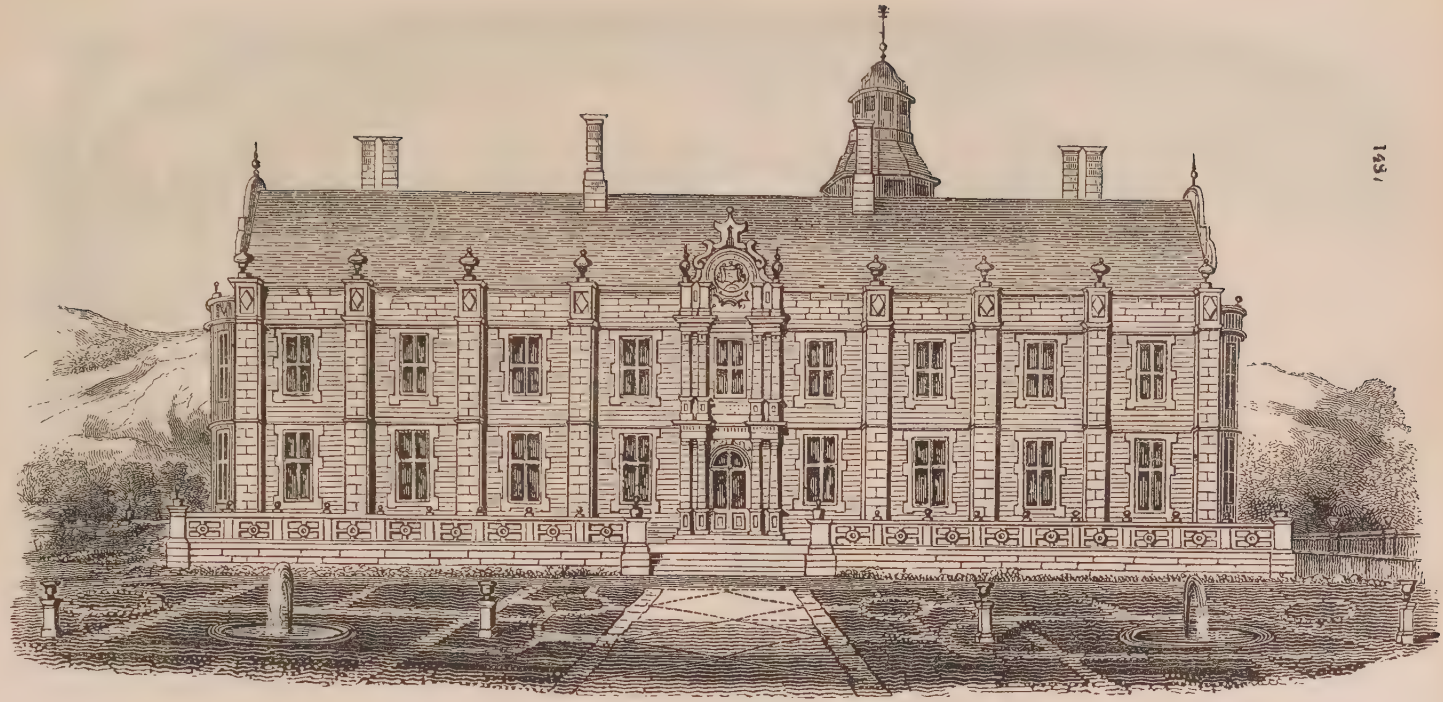
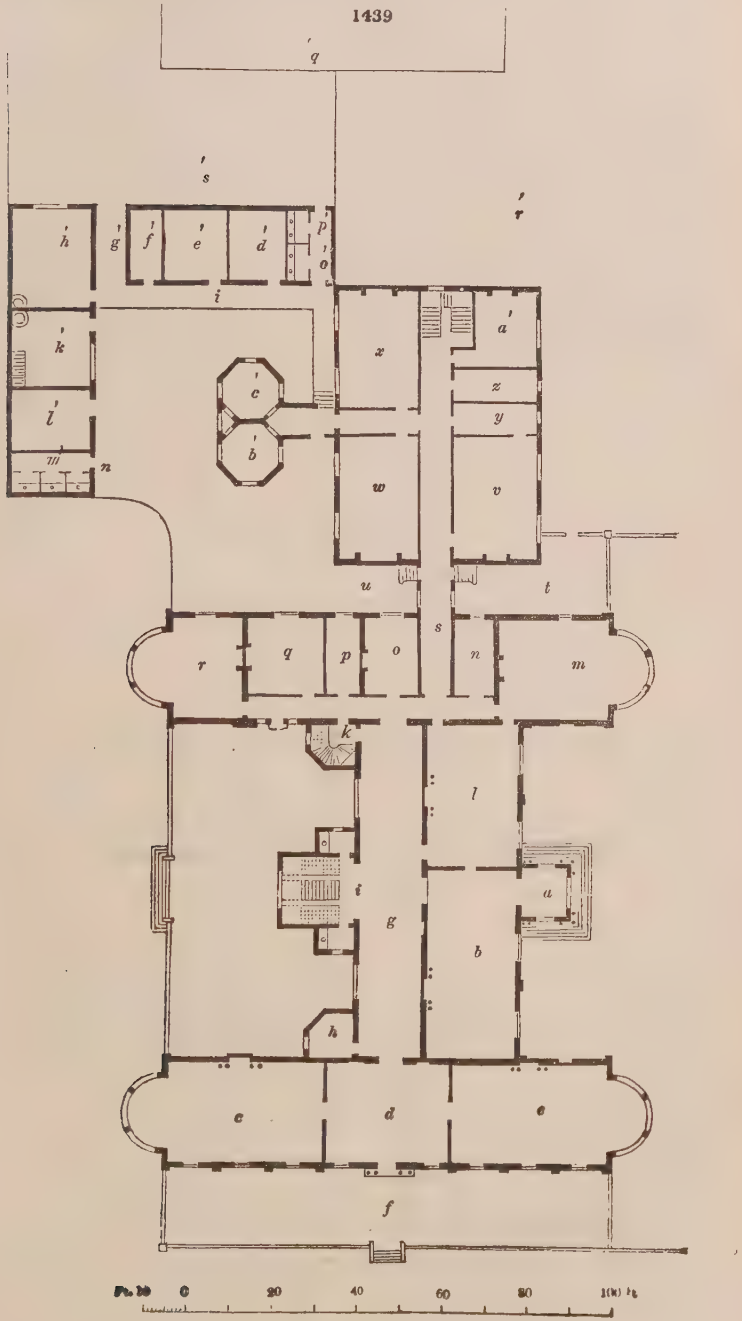


Fig. 1437, drawingroom, or north-east, front of Beau Idéal Villa.

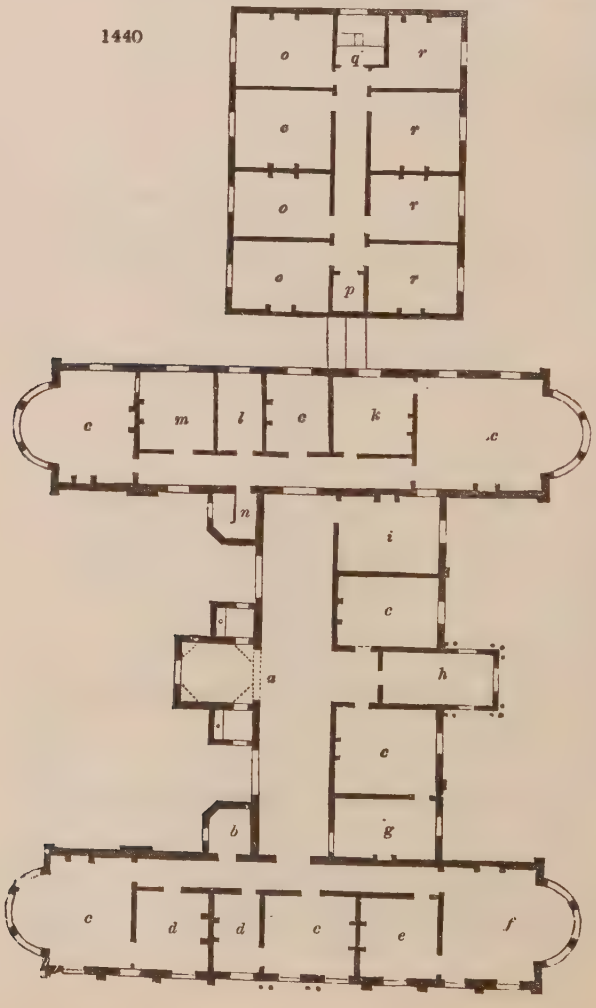
Fig. 1438, the garden-court, or north-west, front of Beau Idéal Villa.
Fig. 1439 is the ground plan, in which *a* is the entrance porch; *b*, the hall; *c*, the



drawing-room; *d*, the saloon; *e*, the library; *f*, the terrace, with a descent to an ancient flower-garden; *g*, the lower gallery; *h*, the lower housemaid's closet; *i*, the principal stairs; *k*, the back stairs, which descend also to the cellars; *l*, the dining-room; *m*, gentleman's private room; *n*, china closet; *o*, butler's pantry; *p*, store-room; *q*, still-room; *r*, housekeeper's room; *s*, passage to the offices; *t*, back entrance to the house; *u*, entrance to the kitchen-court, in which court there is an outer entrance to the cellars; *v*, servants' hall; *w*, kitchen; *x*, back kitchen; *y*, servants' dressing-room; *z*, place for cleaning shoes; *a'*, cleaning place; *b'*, dry larder; *c'*, wet larder; *d'*, coal-house; *e'*, wood-house; *f'*, place for ashes; *g'*, entrance to the kitchen-court; *h'*, brew-house, with laundry over it; *i'*, covered passage; *k'*, wash-house; *l'*, store-room, the laundry extending over it also; *m'*, gentlemen's privy, entered from the garden; *n'*, upper servants' privy; *o'*, privy for female servants; *p'*, men-servant's privy; *q'*, stable-yard; *r'*, park; *s'*, drying-court; *t'*, garden; and *u'*, kitchen garden.

Fig. 1440 is a plan of the chamber-floor; in which *a* is an entrance to the upper gallery from the stairs; *b*, a closet; *c*, bed-rooms; *d*, dressing-rooms; *e*, dressing-room; *f*, bed-room; *g*, dressing-room; *h*, dressing-room, or small bed-room; *i*, lady's dressing-room; *k*, gentleman's dressing-room, both connected with the family bed-room, *u*; *l*, bath-room; *m*, dressing-room; *n*, back stairs; *o*, men-servants' bed-rooms; *p*, closet; *q*, stairs; and *r*, bed-rooms for the men-servants of strangers. Besides these bed-

1440



rooms, there should be a floor of rooms for the female servants, and a nursery over the wing next the offices, the windows looking over the offices. The bed-rooms in this wing would be occupied by the family; and, if they were a few feet lower than the other rooms on the best chamber floor, the garrets would be of a good height, and might be made comfortable rooms. In some large houses, a number of the under servants sleep in one room, without any regard to age, habits, &c.; but there are many objections to this plan, which is often a source of great discomfort to the servants; for instance, those who have to sit up late, disturb those who have gone early to bed, &c. The upper servants should have separate rooms; and the servants of visiters should never sleep in the same rooms with the servants of the family. The bed-rooms for the men-servants are therefore purposely divided, so that they will not contain more than two beds each. Fireplaces are shown in them, in case of sickness, and in order to ventilate the rooms.

Chap. III.

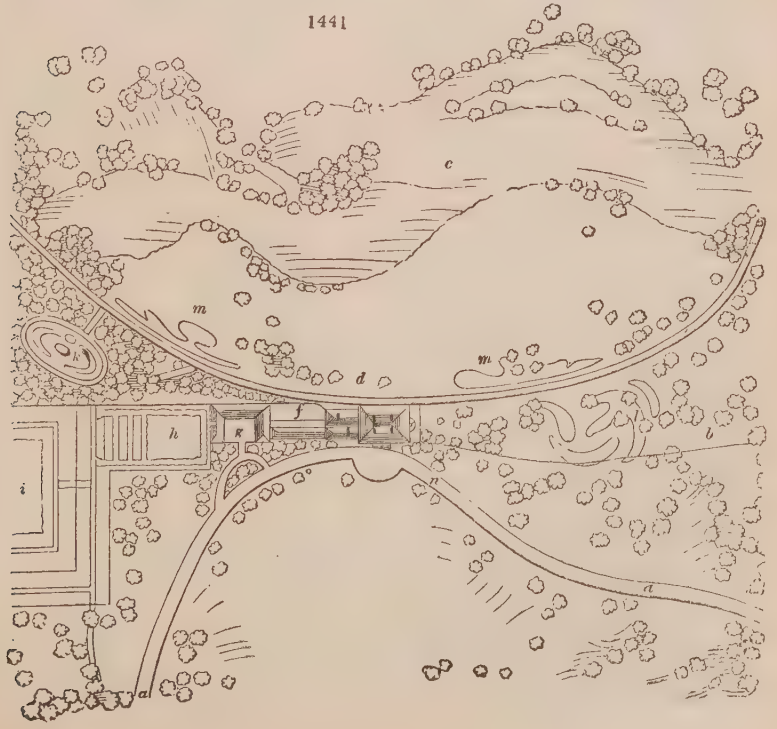
Miscellaneous Designs for Villas, with various Degrees of Accommodation, and in different Styles of Architecture.

1736. *The Designs submitted in this Chapter* are a selection from more than treble the number sent us by different Architects. They are not all to be considered perfect; though a number of them are so nearly so, in our eyes, that we can only speak of them in terms of admiration. Others, though not in all respects to be held up as objects of imitation, yet contain points of excellence in arrangement, or in style, calculated to afford instruction. In a few, there are what we consider to be positive faults; but these we have endeavoured to turn to the advantage of the student; convinced that as much, or even more, instruction is to be given by pointing out faults and their causes, as by exhibiting and explaining beauties. The order followed, as in the preceding chapters of the same kind, is miscellaneous.

Design I. — *A Grecian Villa, of a medium Size, for a Gentleman of Fortune.*

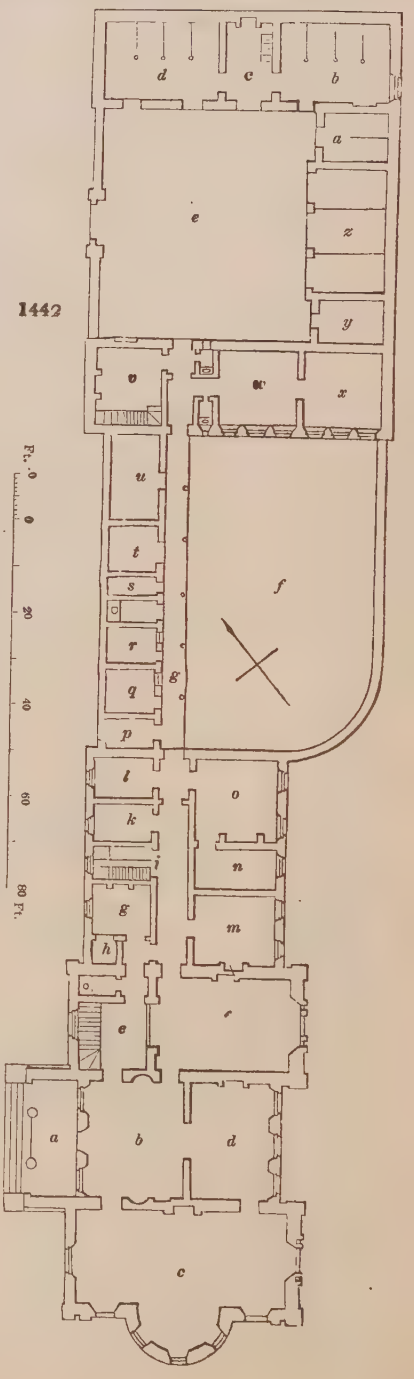
1737. *The Situation* is supposed to be in a park, as shown in the general plan, fig. 1441, in which *a a* are two approaches; *b*, the wire fence separating the park from

1441



the pleasure-ground; *c*, a lake, with islands; *d*, the main walk, broadest in front of the house, and gradually becoming narrower as it recedes from it on each side, till, at the distance of the American garden, *l*, on the right, and the flower-garden, *k*, on the left, it is reduced from twelve feet to eight feet; and when it arrives at the bridges, it is reduced to six feet; *e e*, the bridges over the lake; *f*, the kitchen-court; *g*, the stable-yard; *h*, the melon-ground; *i*, the kitchen-garden; *k*, the flower-garden; *l*, the American garden; and *m*, irregular groups of showy flowers and shrubs. The house, as seen at the point *n*, on the approach from the left, will appear as in fig. 1443.

1442



1738. *Accommodation.* The ground floor, fig. 1442, contains a portico, *a*; entrance hall and billiard-room, *b*, twenty-four feet by eighteen feet; drawingroom, *c*, forty feet by twenty feet; library, *d*, twenty-four feet by eighteen feet; principal staircase and lobby, *e*; and dining-room, *f*, twenty-eight feet by twenty feet: all these apartments are thirteen feet high. There are a butler's pantry, *g*, with plate-closet, *h*, adjoining; back staircase, *i*; pantry, *k*; dairy, *l*; servants' hall, *m*; scullery, *n*; kitchen, *o*; entrance to the offices, *p*; place for cleaning shoes, *q*; place for cleaning knives, *r*; dust-hole, *s*; place for wood, *t*; place for coals, *u*; groom's room, *v*; laundry, *w*, twenty feet by eighteen feet; wash-house, *x*, twenty feet by eighteen feet; dung-pit, *y*; three coach-houses, *z*; nag stable for two horses, *a'*; saddle-horse stable for three horses, twenty-six feet by eighteen feet, *b'*; harness-room, *c'*; coach-horse stable for three horses, twenty-six feet by eighteen feet, *d'*; stable-yard, *e'*; kitchen and drying yard, *f'*; covered way to the laundry, by the stable, *g'*, leading into the kitchen-lobby at one end, and into the stable-yard lobby at the other. Fig. 1444 is a plan of the chamber floor, containing a principal staircase, *a*; four best bed-rooms, *b*; bath-room, *c*; four dressing-rooms, *d*; corridor, *e*; nursery, *f*; four family bed-rooms, *g*; linen-closet, *h*; and back staircase, *i*.

1739. *Construction.* The walls are supposed to be of brick, covered with Roman cement, coloured in imitation of stone, and the roof slated.

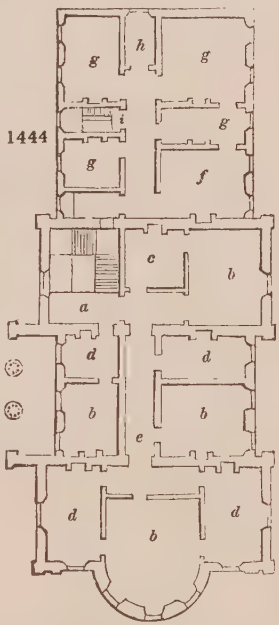
1740. *General Estimate.* The entire contents of the house are 164,648 feet, which may be estimated at nine-pence per foot, or £6174 : 14*s.* : 4*d.*; those of the offices, 67,764 feet, which may be estimated at sixpence per foot, or £1694 : 2*s.*

1741. *Remarks.* This Design has been furnished us by an eminent Villa Architect. It is remarkably complete, more particularly in respect to its kitchen and stable offices. We have supposed it to

1143

be placed on a gentle eminence, in a tame fertile country; and we have disposed of the approaches, walks, kitchen-garden, and other details of a villa residence, in the manner which is now generally considered as in the best modern English taste. The water is supposed to be on a considerably lower level than the house, and to have such a supply as to keep it always clear; and it is therefore less likely to generate mephitic vapours. The grouping of the trees and shrubs, the botanical interest of their different kinds, the water, the grass, and the gravel, constitute the home or foreground beauties of such a residence; and those of the distance are very seldom of any marked character in the midland counties of England. A hill is rarely to be seen, a mountain never; and all that can be hoped for, is a peep at the spire of the village church. A village, a town, a farm-house, a cottage, or the appearance of another villa, at a nearer distance than two or three miles, is considered an intolerable nuisance by the high aristocracy of England. The great object, in laying out the grounds of villas for this class of society, is, to produce the appearance of an interminable natural forest; the villa being placed in one of its most agreeable glades, and every thing seen around appearing to belong to it: such is the kind of solitary grandeur described as the *summum bonum* of an English country residence. The essential cause of this feeling is to be found in the immense chasm which exists between the rich and the poor in this country, not only in point of wealth, but in point of cultivation and taste.

1444

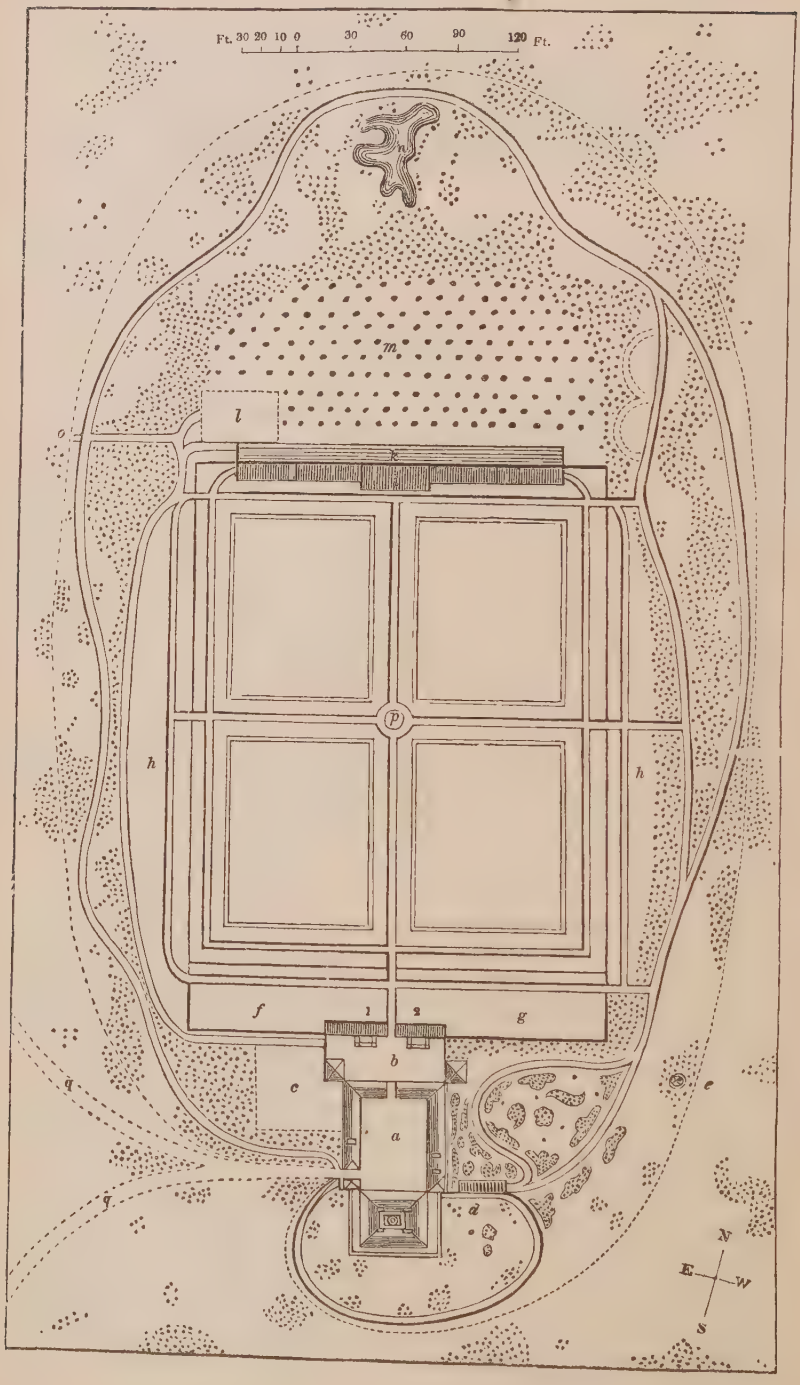


Design II.— *The Accommodations of a Villa of moderate Size, exhibited in the Ground Plan of the House and Offices, and their relative Connection with the Gardens and Grounds.*

1742. *The Object of this Design* is, to show by lines, rather than words, the requisite arrangement of a moderate-sized villa, where accommodation is more the object than architectural display. It has been furnished us, at our request, by James Main, Esq., of Chelsea, and evinces his knowledge of what is requisite to constitute a country residence, as well as his good taste and great experience as a landscape-gardener. No elevation is given, because we have judged it expedient to afford the young Architect an opportunity of devising one, either in the Gothic or Grecian style. Besides, the object, in this Design, is to confine the attention to the accommodation required, and to the connection of the house and the offices with the kitchen and other gardens, the pleasure-ground fence, and the approach-roads and walks.

1743. *The General Arrangement* is shown in fig. 1445. The grounds consist of a kitchen-garden, containing about two acres, and dressed ground exterior to it, and including a lawn surrounding the house; the whole separated from the park by an endless dotted line in the figure, representing an open iron railing, or a sunk fence, or ha-ha. Beyond this dressed ground, the park may extend to fifty or one hundred acres, or upwards. In the general plan, *a* is the entrance-court and offices; *b*, the coach-yard court, with two dung-pits surrounded by low walls; *c*, drying-ground; *d*, conservatory, with flower-garden around; *e*, ice-house, formed under a raised mound planted with evergreens; the door is in the sunk fence, indicated by the dotted line which encloses the whole of the dressed ground and the kitchen-garden, and *f*, the melon-ground; *g*, compartment for

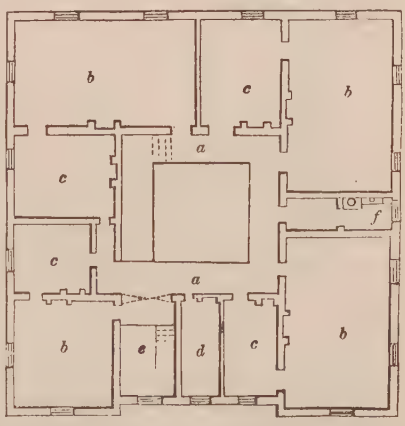
1445



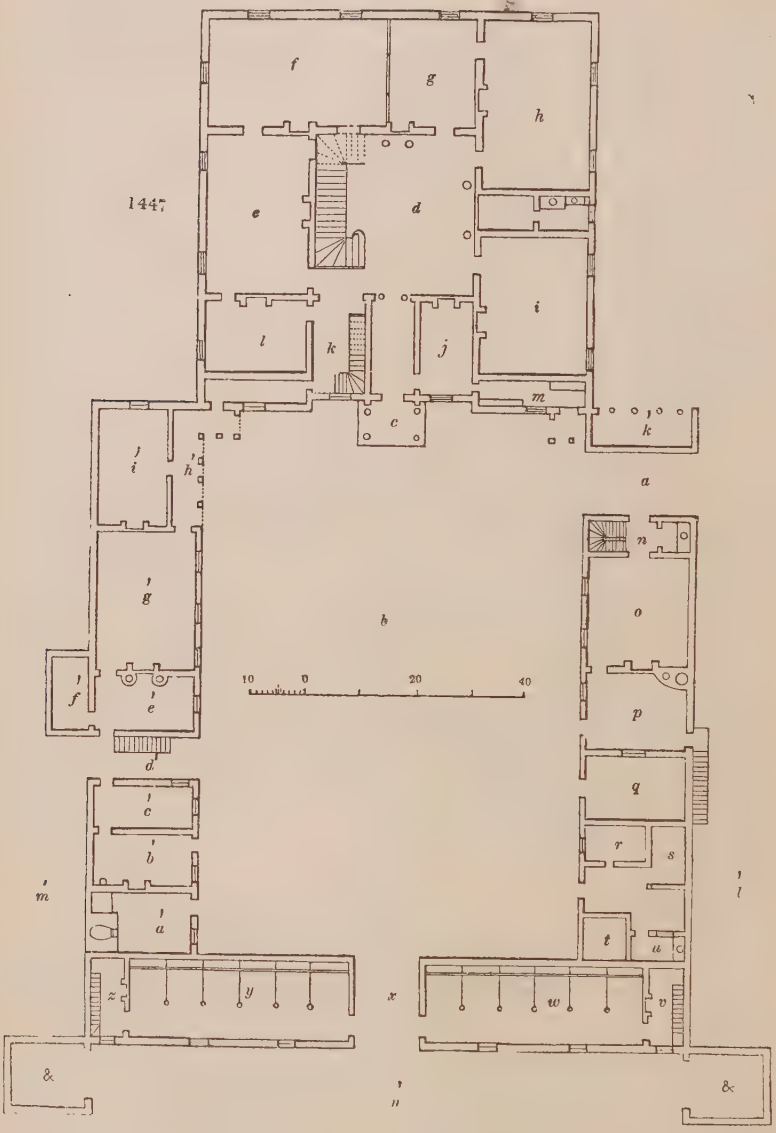
asparagus, sea-kale, rhubarb, and other articles, with two mushroom sheds marked 1, 2; *h*, slips, enclosed by thorn or holly hedges; the outside borders planted with small fruit trees and fruit shrubs; *i*, range of hot-houses; viz., two peach-houses, a vinery, and two pineries; *k*, sheds behind the hot-houses; *l*, mould-yard; *m*, orchard; *n*, aquarium and rockwork; *o*, gate of the cart-road to the coach-yard, mould-yard, and sheds; *p*, basin of water in the centre of the garden; *q q*, lines of approach to the entrance-court. The advantages of this disposition of the house, offices, and pleasure-ground of a villa, Mr. Main observes, "are, the compactness and unity of design which it presents. Every thing, whether useful or ornamental, necessary to render such a residence complete, is here included within the sunk fence. From the endless walk within this fence is seen, over a foreground of lawn and trees and shrubs, the scenery of the park, and the features of the surrounding country, whatever they may be. Any necessary subdivisions of the park, for agricultural purposes, may be made, without in the slightest degree interfering with the ground consecrated to the house. Various statues, sculptures, vases, and other architectural ornaments, may be distributed among the flower-beds near the house, and along the endless walk. A gardener's house may be placed in the orchard, or behind the vinery at *k*, exactly in the centre of the range of glass; and the living and sleeping rooms should be so high as to overlook the whole of the garden and the orchard.

1744. *Accommodation.* The ground plan is shown in fig. 1447. The main entrance is through the archway, *a*, into the court, *b*; from which there are a portico, *c*, and passage leading to the central hall, *d*; round this hall are arranged the following apartments; viz., dining-room, *e*; drawing-room, *f*; small drawing-room, *g*; library, *h*; breakfast-room, *i*; housekeeper's room, *j*; passage, leading from the kitchen and back stairs, *k*; butler's pantry, *l*; passage, with linen closets and presses along the walls, leading to the housekeeper's room, *m*; entrance to the cellars, and laundry-stairs, &c., *n*; laundry, with coal-cellar under, *o*,; wash-house, *p*, with a cellar under it, and back stairs to the drying-ground, which is on a level with the floor of the coal-cellar; coal-house, *q*; knife-hole, *r*; wood-house, *s*; ash-hole, *t*; man's water-closet, *u*; groom's harness-room, with a bed-room over it, *v*; riding-horse stables, with a loft, *w*; archway between the stables, *x*; coach-horse stables, with loft over them, *y*; coach-harness room, and bed-room over, *z*; coach-houses, &; bakehouse, *a'*; scalding-house, with pump, *b'*; dairy, *c'*; covered passage, with stairs to the rooms over the scullery and dairy, *d'*; scullery, *e*; larder, *f'*; kitchen, *g'*; passage from the kitchen to the main body of the house, *h'*; servants' hall, *i'*; open alcove, *k'*. There is a drying-yard at *l*, a kitchen-yard at *m'*, and a dung-pit in the direction of *n'*. The chamber floor, fig. 1446, contains a gallery, into which all the bed-room doors open, *a*; four bed-rooms, *b*; with four dressing-rooms, *c*; a bath-room, or bed-room for an upper servant, *d*; and back stairs, *e*. There is a ladies' water-closet, *f*, with a lobby, and screen-door from the gallery.

1446



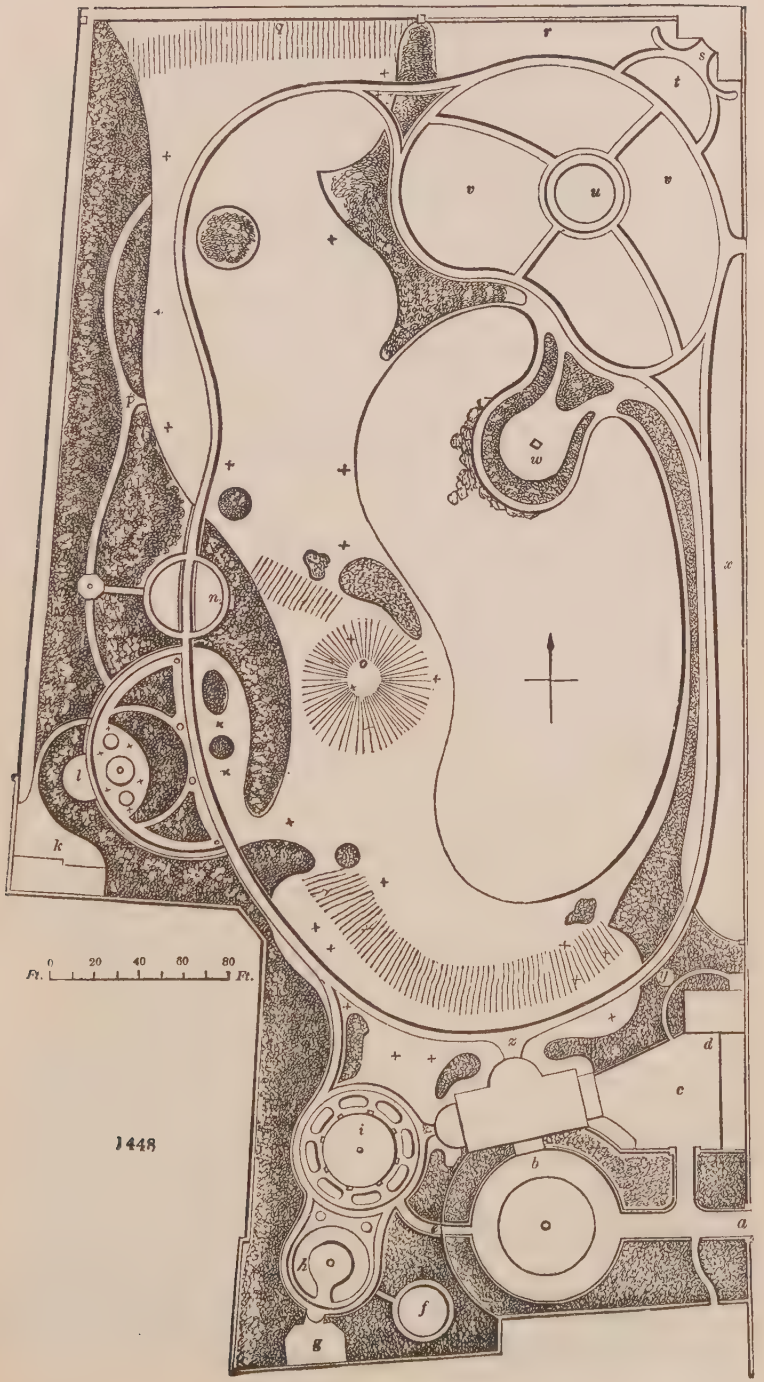
1745. *Remarks.* There is a great deal of comfort in this Design, and much economy of both room and labour is produced by entering through the general court, in which the carriages of strangers may stand, so as to be easily called at all times. The whole of the doors to the servants' offices around this court are so contrived as to be directly under the eye of the housekeeper. The distance of the kitchen from the dining-room will be objected to by some, as incurring the risk of cooling the dinner; while it will be approved of by others, as insuring the absence of all kitchen smells in the main body of the house. Many will consider the central hall much too large, and object to all the doors of the bed-rooms opening into one gallery; others, on the contrary, will approve of this arrangement, on account of its simplicity. In laying out the grounds about the house, a terrace, and those other architectural appendages for which we have been contending, Chapter I., § 1648 to § 1674, will, of course, not be forgotten, either in this Design, or in the preceding one; though, in both cases, the ground plans are too small to show them properly.



Design III. — *A Suburban Villa of Two Acres and a half, the House and Grounds built and laid out by an Architect for his own Residence.*

1746. *The Situation* of this villa is within a mile and a half of London, on a surface which originally sloped gently to the north; but which had been rendered as irregular as could be desired, by pits excavated for gravel and brick earth. By deepening and extending the largest pit, a basin for a considerable piece of water has been obtained; and, by taking advantage of three heaps of earth, one knoll has been formed, on which to place the house; another, of irregular shape, to crown with wood; and a third, smaller, and very steep on one side, to face with rock as a promontory projecting into the water, and concealing its boundary from every point, and as a nidus for rock plants, ferns, &c.

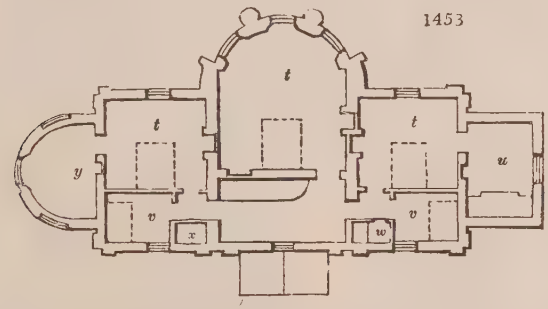
1747. *The Grounds.* Fig. 1448 is a general plan, showing the position of the house,



1448

side of movable boards, covered, like the rest of the floor, by the carpet, but distinguished by their adjoining the claws of the column which supports the table. By pressing on these parts slightly with the foot, the master or mistress can ring a servant's bell, at pleasure, without rising from the table. The drawing-room is shown at *s*, twenty-five feet by twenty feet, exquisitely finished, with a fireplace by Metheley, having polished steel sides placed at an angle of 45°, which reflect the fire, and produce a singularly brilliant effect, as well as throw out great heat; the ceiling is beautifully painted in imitation of sky and clouds, and the cornices are richly carved and gilt. Fig. 1453 is the plan of the chamber floor, in which *t t t* are three principal bed-rooms,

1453

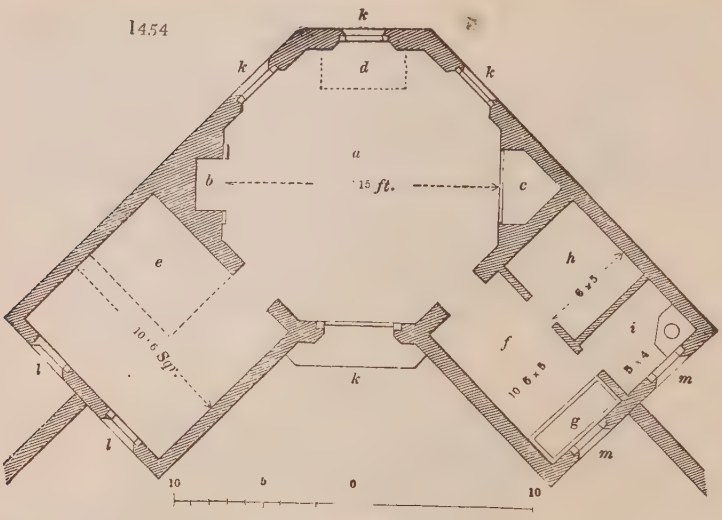


and *u* a dressing-room with a bath. At any moment throughout the year a hot or cold bath may be obtained, without troubling the servants, by the following means: there is a cold-water cistern under the roof, and a hot-water cistern at the back of the kitchen fireplace: in this last cistern there is a coil of lead pipes, one end of the pipe communicating with the cold-water cistern above, and the other with the bath. By turning a cock in the bath-room, the water descends from the cistern under the roof, is heated in passing through the coil of pipes behind the kitchen fire, and ascends by the pressure of the atmosphere on the cistern to the bath. Another cock and pipe, leading directly from the cistern, admit cold water to the bath, so as to temper it at pleasure; and a third pipe serves to convey away the water when done with. The cover of the bath is fitted with a basin, so as to serve as a dressing-table. We have seen this bath filled in the course of a few minutes, and can attest its answering most completely. There are two small bed-rooms, *v v*; a water-closet, *w*; a linen-closet, *x*; and a dressing-room or nursery, *y*, to one of the bed-rooms.

1750. *Construction.* The walls are of brick, eighteen inches thick, and laid in Roman cement to the height of the principal floor; above which they are hollow, and about fourteen inches in thickness; exteriorly, they are covered with Roman cement, drawn (that is, with the courses and sizes of the stones marked by lines), and tinted in imitation of Bath stone. The roof is covered with blue slates, and the chimney-tops are terminated by square chimney-pots, also tinted in imitation of stone. The basement floor has the pavement laid hollow, and the outside walls are protected by half arches, so that this floor is as dry as any part of the house. Cast-iron bricks are built in the outside walls, so as to admit a circulation of air between the floors and ceilings. The billiard-room, fig. 1448, *g*, is finished within, in imitation of stone, with a coved ceiling, double skylight, and boarded floor; it is heated by one of Sylvester's low air-stoves, to be hereafter figured and described. The billiard-table is of cast iron.

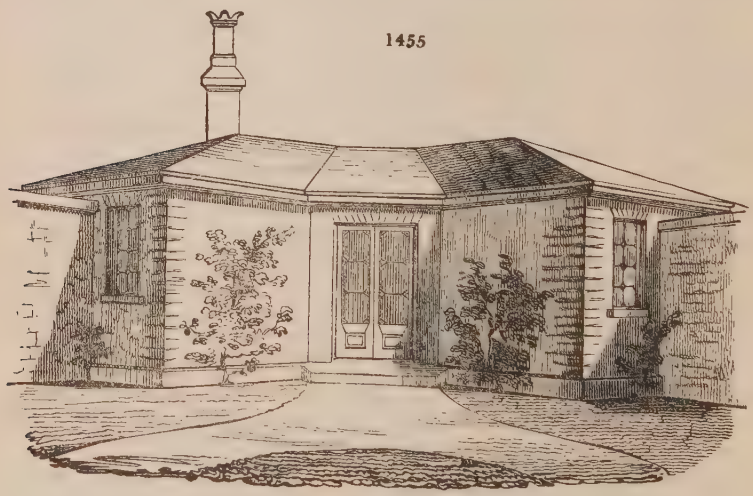
1751. *The Gardener's House* is a model of contrivance and efficiency in its way. Fig. 1454 is the ground plan; in which *a* is the living-room, an octagon fifteen feet in diameter, with a fireplace, *b*, and a large closet or pantry, *c*. There is a trapdoor in the floor at *d*, to a store-cellar below; and in the centre of the ceiling there is another trapdoor, to a seed-loft and herb-room in the roof. The stepladder, by which the loft is entered, stands under the trapdoor to the cellar, serving as a stair to it, so that it is always at hand to be used for going into the loft. It will be observed that this room commands the diagonal of the space within the garden, and an entire square of space without it, as indicated by the letters *k k*. The bed-room, *e*, commands by its two windows the south and north sides of the wall, which lies east and west (or what, from its aspect, is commonly called by gardeners the south wall, as indicated by the letters *l l*. There are a scullery, *f*, with a sink, *g*; a coal-house, *h*; and water-closet, *i*. From the two windows of *g* and *i*, the east and west sides of the eastern boundary of a square garden are commanded by the gardener, as indicated by the letters *m m*. The gardener, or his wife, seated in the centre of the living-room, with the bed-room and scullery

1454



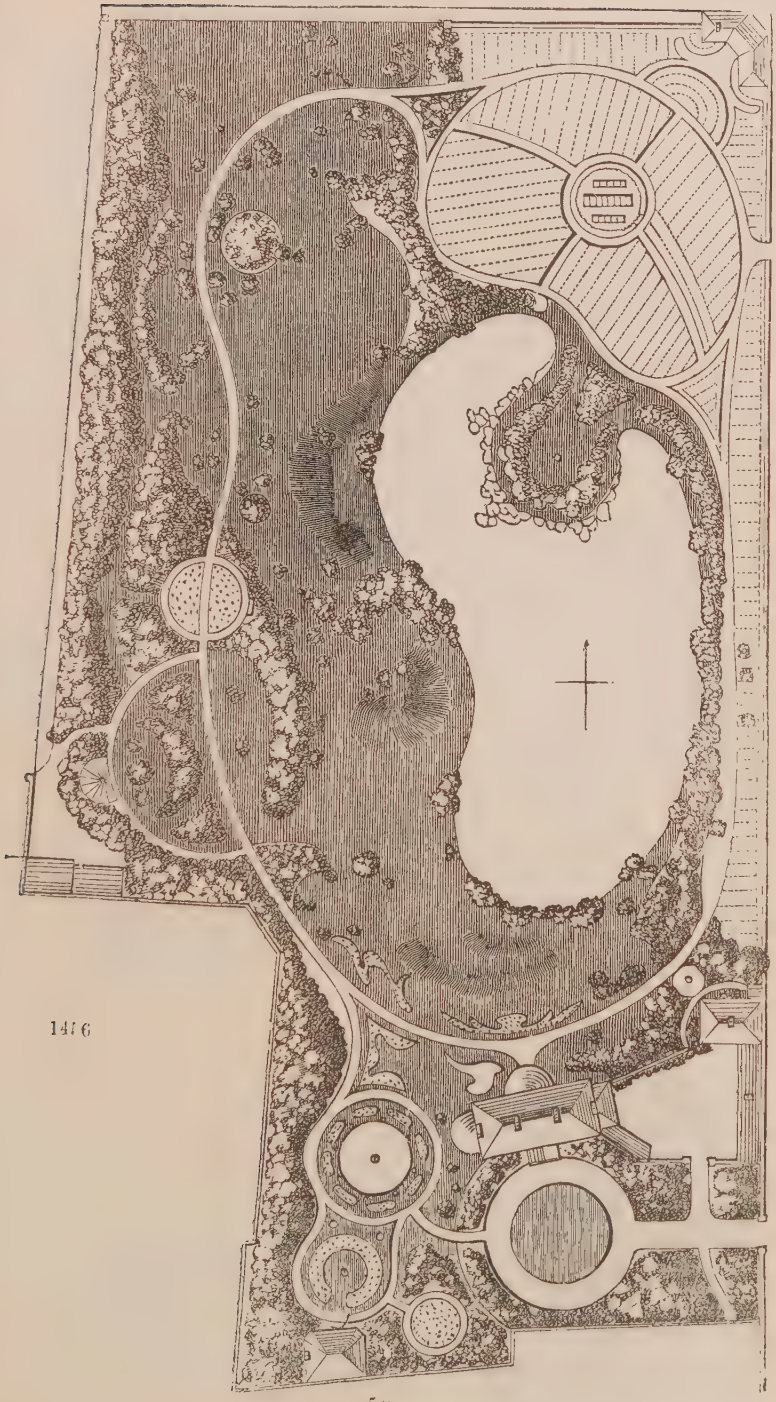
doors open, will command, from that position, the whole of the interior of the garden. If it were desired to add to the accommodation of this dwelling, it might easily be done by a staircase taken from the living-room, descending to a floor below, containing the apartments *f*, *g*, *h*, *i*, and a kitchen; and ascending to a floor above, of either one octagon room in the centre, or three rooms. Fig. 1455 is a perspective view of this house, as

1455



seen placed in the north-east corner of a walled garden. To the right and left are seen portions of the south and west walls, and in the centre is the entrance door.

1752. *Remarks.* Considering the size of this villa, its completeness, and the extent of its accommodation, conveniences, and luxuries, exceed any thing of the kind we have ever before met with. If we had only seen the plan, or heard of such a villa, we should have spoken of it with some hesitation; but having been familiar with the ground before it was built, and when it had the appearance of heaps of rubbish, and holes filled with water; and watched the whole of its progress, from 1825, when our friend commenced his operations, to the present time, we can speak with confidence relatively to the effect of the whole, and the complete success of all the details; we could even say a great deal



1416

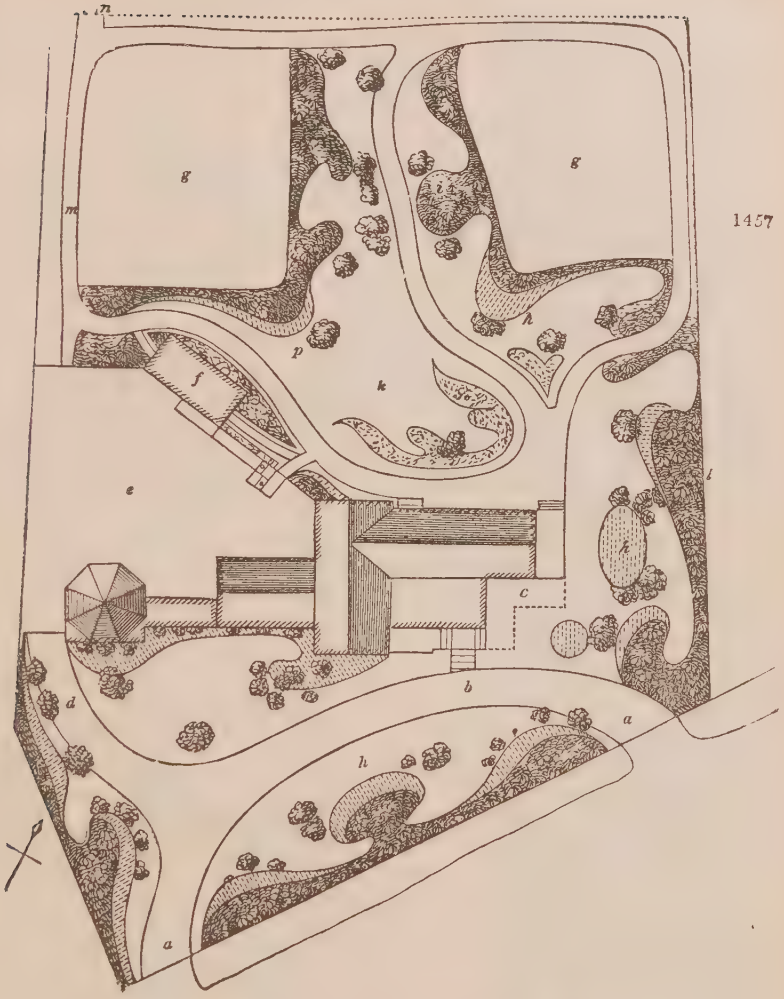
50

more, did we not fear being considered partial. We shall, however, sum up our opinion in one sentence, which is, that, taking the place altogether, we do not believe there is such another in the neighbourhood of London. Such a villa, indeed, is only to be expected from an Architect of taste, and of ample means, working for himself. Had the situation been more favourable, the effect might have been more brilliant; but the contrast between its present and its former state, and, by consequence, the gratification to the owner and improver, would have been less. Notwithstanding these encomiums, we are aware of some objections which may be made to the laying out of the grounds, as shown in the plan, fig. 1448, and also to the exterior Architecture of the house, fig. 1449. It may be objected to the plan, that the lines are too formal and unbroken; but it must be recollected, that scarcely any of these lines, except those of the walks, can be recognised as lines in the reality. The plan, fig. 1448, is, in short, a working-plan, calculated to show the gardener what ground is to be dug and planted, and what is to be laid down in grass; together with the direction of the gravel walks. The single trees and small groups, which are indicated in the plan by crosses (× ×), will break all the lines both of the dug groups and the water, and produce an effect altogether different from that shown in fig. 1448. Even the spreading of the shrubs over the margins of the dug groups will totally destroy that appearance of lines which forms the prominent feature of the plan, as it appears on paper. However, independently altogether of the breaking of these lines by vegetation, there is a certain degree of beauty which belongs to lines and forms simply considered, and without any reference to the substance of which the forms are composed. Now, the question is, how far our Architect has succeeded in this kind of beauty. In most parts of the plan we think his success perfect; but in others we should, perhaps, have made some variation; and the principle by which we should have been guided in so doing would have been that of adapting the forms to their local situations alongside of the walks. The extent, however, to which we should have done this is not great. The effect which we should desire from such a plan as that before us, we have endeavoured to show in fig. 1456; and this is, as nearly as possible, the actual effect on the grounds. The great beauty which, in fig. 1456, is added to fig. 1448, is that of intricacy; which is a main source of visual enjoyment, by nourishing curiosity, keeping alive attention, and stimulating the process of examination. The mind takes delight in penetrating into recesses, and making discoveries of new beauties at every step; in tracing, in the forms of nature and chance, something of those of art; in bringing shape and figure out of apparent irregularity and confusion; and in finding every where, the principle of connection and cooperation towards the formation of a beautiful and expressive whole. The kitchen-garden is not to be considered as having any beauty as such, further than as it produces good crops of vegetables. It is placed and arranged so as not to interfere with the idea of extent, which is always an idea to be cherished in a limited space; and which, in England, is sought after by most people, as creating allusions to the extensive parks and pleasure-grounds of the aristocracy. The full and characteristic beauties of a kitchen-garden are only to be obtained when it is surrounded by walls, and laid out in right lines; but such a garden would have totally destroyed the effect aimed at in the place before us. With respect to the interior arrangements of the house, and all its fittings-up, fixtures, and furniture, we are altogether incapable of doing them justice. No room is lost in passages, not an inch of space is wasted on any floor, and every comfort and accommodation is included that can be desired in a villa of this size and description.

Design IV. — *A Villa in the Anglo-Italian Style, with Three principal Rooms, and with a Stable and Coach-house.*

1753. *The Situation* intended for this villa is in the neighbourhood of Guildford in Surrey, on the south-east of the turnpike road between Kingston and London. The ground rises gradually from the footpath of the road, at the rate of about one foot in ten, and the house was intended to be placed back from it about fifty feet, with the yards and gardens arranged as shown in fig. 1457. The general appearance of the side next the road is shown in the perspective view, fig. 1458, which is taken at the distance of 300 feet from the angle of the building. In the general plan, fig. 1457, to a scale of fifty feet to an inch, *a a* are the two main entrances from the public road, *o*; *b* is the principal door of the house; *c*, terraces; *d*, road to the yard; *e*, yard; *f*, green-house; *g*, kitchen-garden; *h*, beds and borders of flowers; *i*, beds and borders of trees and shrubs; *k*, lawn; *l*, an iron fence separating the garden from the meadow; and *m*, communication between the stable-yard, *e*, and the meadow, *n*. The contents of the garden, lawn, yard, house, &c., are three roods twenty-six poles, and of the meadow, three roods three poles.

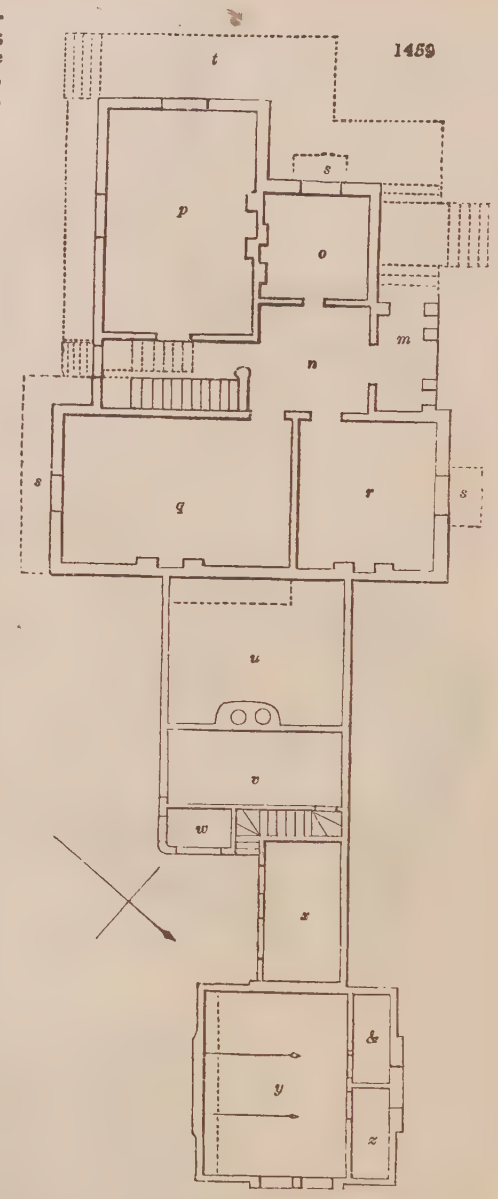
1754. *Accommodation.* The basement plan, fig. 1460, shows a kitchen, twenty-four feet by fifteen feet and a half, *a*; scullery, *b*; coal cellar, *c*; footman's bed-room, *d*; footman's



1457

1458

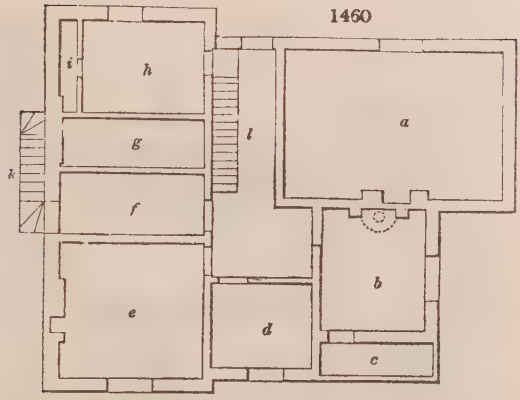
pantry, *e*; beer-cellar, *f*; wine-cellar, *g*; larder, *h*; closet, *i*; stair communicating with the brewhouse, *k*, and house stair, *l*. The ground plan, fig. 1459, shows an entrance lobby, *m*; hall, *n*; store-room, *o*; drawing-room, *p*; twenty-four feet by fifteen feet nine inches, and twelve feet high; dining-room, *q*, twenty-four feet by fifteen feet nine inches, of the same height; morning room, *r*, fifteen feet nine inches by fourteen feet nine inches; areas to the windows of the basement story, *s*; terrace with veranda over, *t*; brewhouse, *u*; coach-house, *v*; place for cleaning knives and shoes, &c., *w*; tool-house and servants' privy, *x*; three-stalled stable, with loft over, *y*; bin-room, *z*; and harness-room, *&*. The chamber floor, fig. 1461, contains a chamber, *a*, twenty feet by fifteen feet nine inches, and nine feet high, with one window to the south-east, and another opening to a balcony or loggia fronting the south-west; a chamber, *b*, of similar dimensions, opening to a loggia facing the south-east; a chamber, *c*, with a dressing-room and bath, *d*, adjoining; another bedchamber, *e*, and a water-closet, *f*. Over the brew-house and coach-house are two other rooms, *g* and *h*. The plan of the attics, fig. 1462, shows a large servants' room, *i*, another, *k*; two closets, *l* and *m*, and another servants' room, *n*. Fig. 1463 is the plan of the hayloft, entered by a trapdoor.



1755. *Construction and Arrangement.* Fig. 1464 is the entrance front elevation; and fig. 1465 is the back elevation of the garden front. Fig. 1466 is an elevation of the north-east side, and fig. 1467 is an elevation of the south-west side. Fig. 1468 is a section at the eaves, in which are shown a cut bracket four inches thick, *o*; false rafter, one foot five inches by four inches, *p*; rafter, four inches by two inches and a half, *q*; concealed eaves gutter, *r*; slate-boarding, *s*, and deal soffit, *t*.

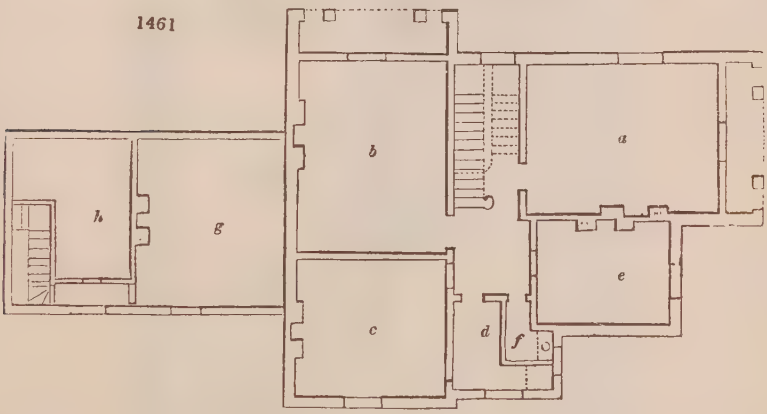
1756. *Remarks.* This villa was designed for a person who died just before the period fixed for carrying it into execution. The drawings were kindly sent us by John Perry Esq.; accompanied by the following remarks, by his assistant, Mr. Varden: — "The terrace was not to go all round the building, as it would have interfered with the offices. The vases were to be of Austin's artificial stone, or of Peake's earthenware. The walls were to be built of brickwork, and faced with the best grey stocks, carefully picked of a uniform colour; the stringing courses, cornices, &c., were to be of Bath stone, and the sills of Portland.

1460



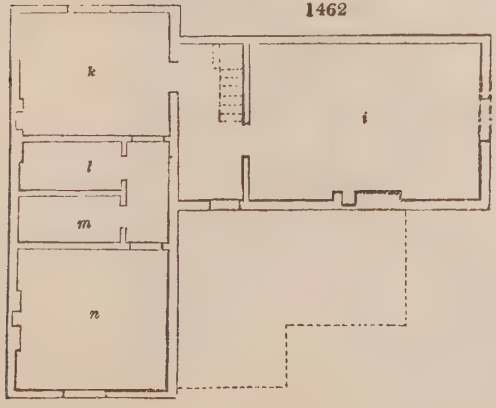
The latticework was to be of inch deal, two inches wide, three inches apart, halved together. The chimney-shaft, which is of Bath stone, and the flower galleries at the lower windows of woodwork, are both similar to those in my Design, § 231. The two rooms over the

1461

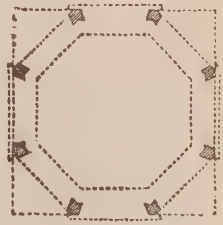


coach and brew houses were for the occupation of an elderly couple, the coachman and his wife, who were to live on board-wages. The disposition of the rooms on the prin-

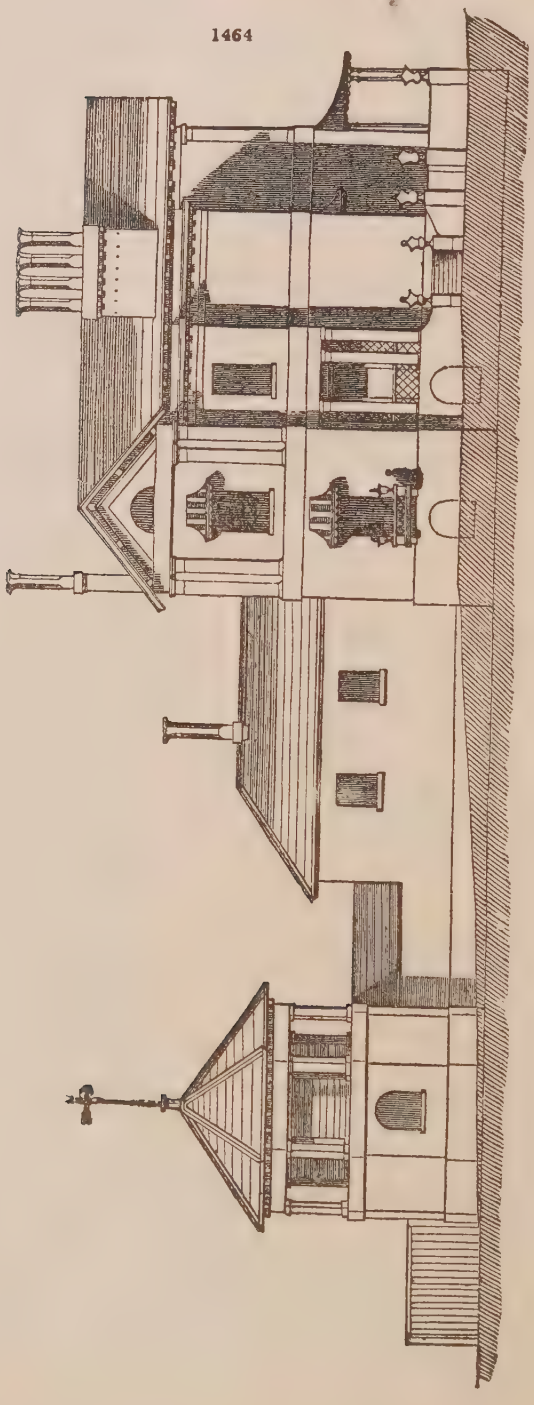
1462



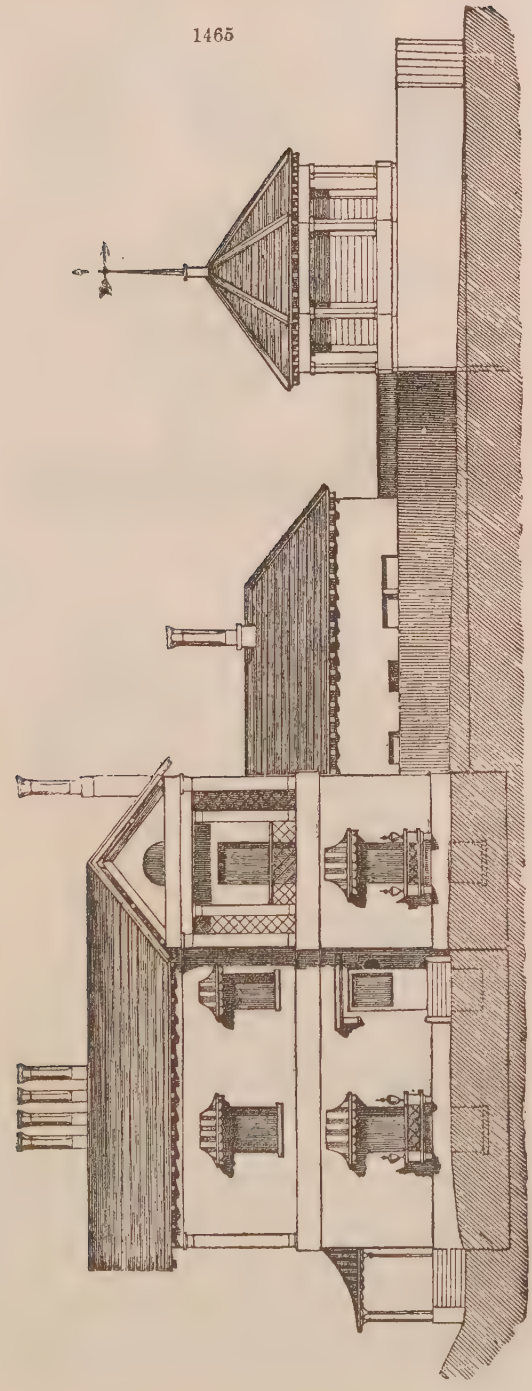
1463



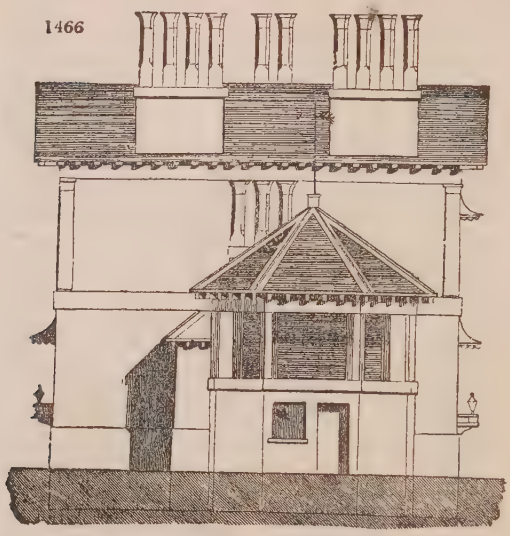
1464



1465

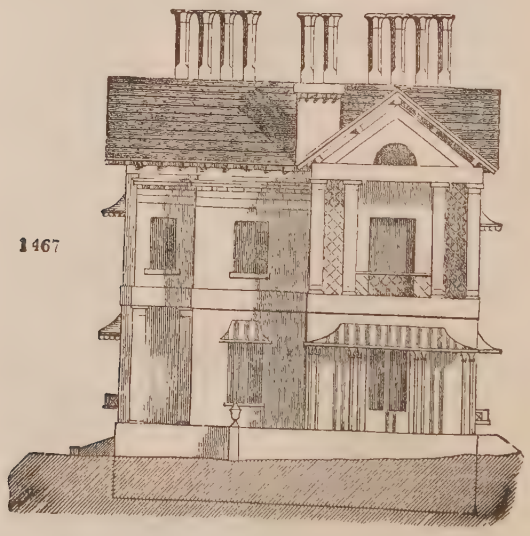


1466



cipal floor was regulated by the aspect, &c., of the locality. The lobby was placed in an angle, the better to shelter the entrance door of the hall from the northerly winds,

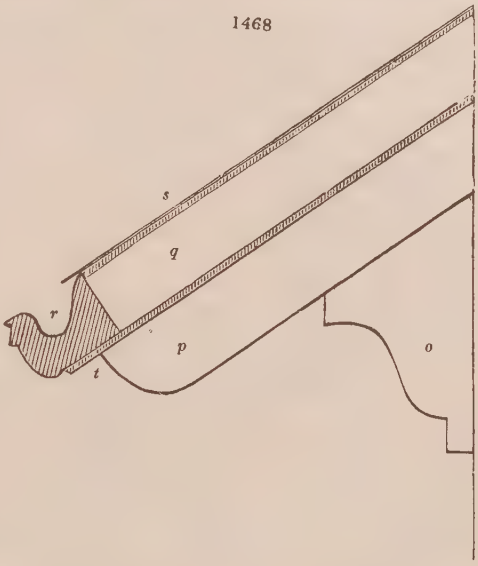
1467



which are very cutting in that neighbourhood. The window of the morning room commands a view of the road; the dining-room window is to the south-east, and the drawingroom has one in the same direction, and another to the south-west that reaches to the ground, and opens on to the terrace; but it is sheltered by a veranda from the afternoon and evening sun, which would otherwise be very annoying. A store-room I consider indispensable in every country residence. The morning room, when not occupied, could be used to usher visiters into while being announced. The chambers have nothing uncommon about them, unless it is those over the dining and drawing rooms, which have windows down to the floor opening under the porticoes. If either of these, but especially the former, should be for the use of an invalid for whom it might be considered desirable to retain an equable temperature throughout the night, this

might be in a great measure accomplished by having close shutters, partly glazed, that could be placed across the openings of the portico, so as to exclude the air; thus the chamber would be insulated, and would not be affected by any sudden alterations of the weather. There is but one staircase in the house; but this was in consequence of the proposed occupant not desiring a separate one for the servants, except from the basement; and that is carried up from the open or beer cellar into the brewhouse, and so into the yard. The brewhouse was to serve as a washhouse, &c. The large room on the attic floor, if used as a nursery or play-room for children, would require more air and light, and this might be obtained by opening windows towards the north-west that would not interfere with the present elevations. Over the dressing-room there might be a large cistern to receive a part of the water from the roof, which would supply the water-closet, and might, if desirable, be conveyed by pipes into the principal chambers. The closet in the larder was intended for table-cloths, &c, in use. The tool-house could be used for storing potatoes, as well as for depositing garden implements." The general effect of this Design is remarkably good, and the arrangement and details are most carefully considered. The plan for laying out the grounds shows Mr. Varden to have a very good taste in that department.

1468

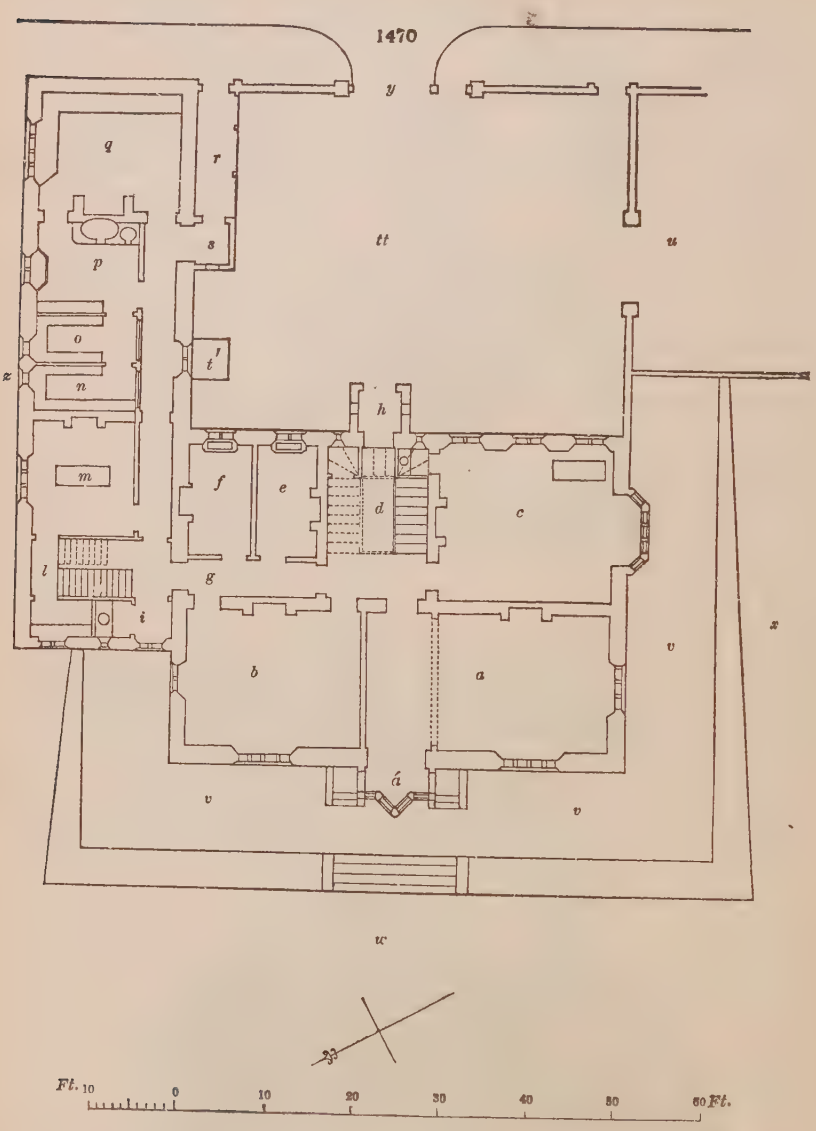


Design V. — *A Parsonage House for a particular Situation in Somersetshire.*

1757. *Accommodation.* The general appearance is shown in fig. 1469, which is a perspective view of the garden front. In the ground plan, fig. 1470, *a* is the drawing-

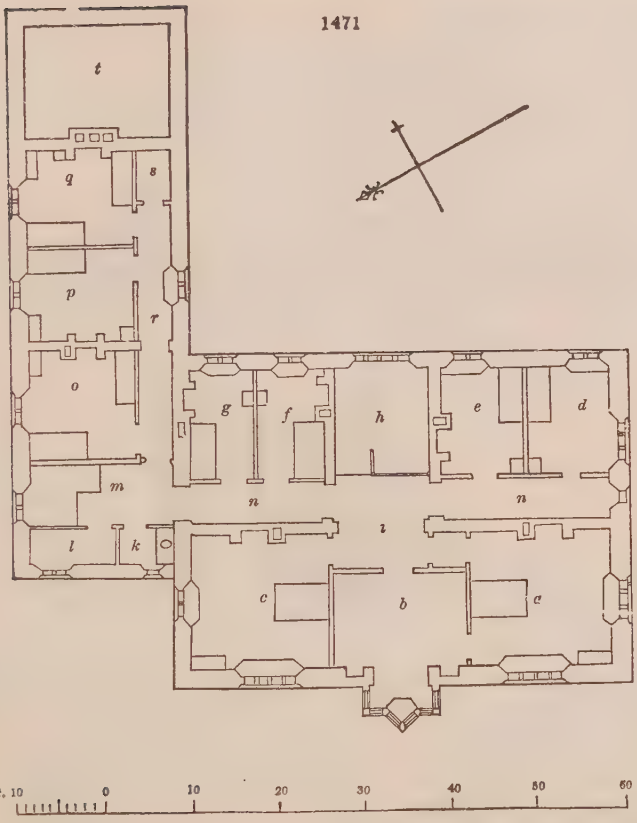
1469

room, twenty-eight feet by fifteen feet, with bay window, *á*, seven feet and a half wide, and two side outlets to the terrace; *b*, dining-room, twenty feet by sixteen feet, with company and service entrances; *c*, library, twenty-two feet by seventeen feet, with Lath sunk in the floor and private water-closet; *d*, hall with oak staircase, closet for sticks,



&c., and inner lobby; *e*, housekeeper's room, with sink supplied by hot and cold water pipes from the kitchen, presses, &c.; *f*, butler's pantry, with sink, &c., presses, &c.; *g*, servants' passage; *h*, entrance porch; *i*, water-closet and lobby; *k*, servants' cleaning-room, and *l*, passage thereto from servants' hall; *m*, servants' hall, thirteen feet by twelve feet, with oak dining-table and presses; *n*, dairy fitted up with slate shelves, and zinc fly-wire in the windows, &c.; *o*, pantry and larder, fitted up with slate shelves, and with zinc fly-wire in the windows, &c.; *p*, scullery, with oven, copper, hot-closet, sink, &c., dresser, &c.; *q*, kitchen, with steam range and close boiler at the back of it, for the supply of the bath, and the several sinks on the ground floor, and the housemaid's sink on one-pair floor; *r*, covered way from the kitchen-gate to the kitchen-porch, *s*; *tt*, court-yard; *t'*, flap and entrance to cellarage under the whole of the house, for ale, beer, wine, coals, coke, wood, lumber, &c. &c.; *u*, stable-yard; *v*, turfed terrace; *w*, lawn; *x*,

1471



lawn and shrubberies; *y*, entrance, foot, and carriage gates; *z*, shrubbery between house and church-yard; and *&*, public road, with footways on each side. Fig. 1471 is the one pair of stairs plan; in which *a* is the best bed-room, with entrance lobby; *b*, a boudoir, with bay window; *c*, *d*, *e*, *f*, and *g*, family bed-rooms; *h*, staircase; *i*, lobby; *k*, water-closet; *l*, linen and store closet; *m*, servants' staircase; *n*, passage through the house, with ventilation and light at each end; *o*, housekeeper and lady's maid's bed-room; *p* and *q*, servants' bed-rooms; *r*, servants' passage, with housemaid's sink and closet, *s*; *t*, upper part of the kitchen. There are lofts above the main body of the house; and space for additional bed-rooms.

1758. *Remarks.* This Design has been sent us by Charles Barry, Esq., the distinguished Architect of the Traveller's Club-house, and of the Manchester Institution, &c., to whom we have before acknowledged our obligation for revising the plans and views of our correspondent Selim's Beau Ideal villa. "This Design," Mr. Barry observes, "was made for a parsonage, to be erected in a most delightful situation in Somersetshire, commanding an extensive view of the Mendip and Wrington Hills, the Bristol Channel, &c.; and having the parish church, which is a very picturesque Gothic building, adjoining it, and in view from the windows of the principal rooms. These circumstances suggested the character of the Design, and the form of the window in the lawn front, which admits of a convenient view of the surrounding scenery from the drawing-room and boudoirs. The building is proposed to be erected of the stone of the country, a close grit, and of a cream colour; the coins, window-dressings, parapets, bonding, and lacing courses (vertical and horizontal bond), being rubbed, and the intermediate spaces faced with rough wall-stone (rubblework) in regular courses, and hammer-dressed. The cost of the building will be about £1800." Our readers, we are sure, will admire with us the great beauty and marked character of this Design externally; no less than the fitness, completeness, and luxury of its internal distribution. Mr. Barry states that the local circumstances

gave rise to the style, and to the form and situation of the principal rooms and windows. This is what ought always to be the case in designing buildings for the country; and, if it were so, every Design would be an original composition belonging to its particular locality. We admire in this Design the manner in which the principal pieces of furniture in each room are disposed, and could wish that in all plans this mode were adopted. As Villa Architecture improves, it will go hand in hand with furnishing and landscape-gardening; and the Villa Architect will eventually find himself under the necessity of studying and directing both these accessary departments.

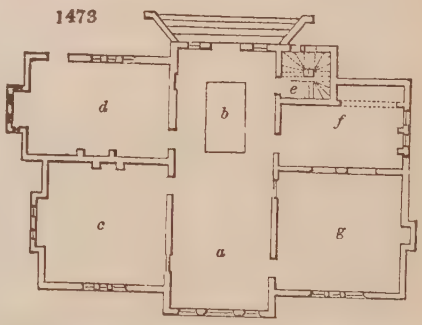
Design VI. — *A Cottage Villa in the Gothic Style.*

1759. *The Situation* is supposed to be on a gently elevated surface, on the Surrey side of the metropolis; the garden and pleasure-ground not occupying more than half an acre, and laid out so as to include a kitchen-garden, orchard, and drying-ground, aviary, green-house, and pits in frames; the two latter being supposed to be heated from a fire and hot-water apparatus in a hot-house and potting-shed behind the green-house. The general appearance of the house, on entering from the road, will be as in fig. 1472.

1472

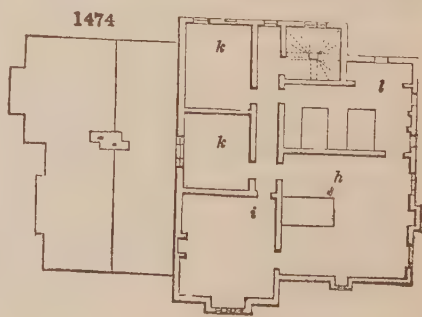
1760. *Accommodation.* The principal floor, fig. 1473, shows an entrance hall, *a*, with billiard-table, *b*; dining-room, *c* kitchen, *d*; staircase down to the cellar floor, and up to the bed-rooms, *e*; library, *f*; and drawingroom, *g*. The dining-room and drawingroom are each twenty feet square, and twelve feet high to the top of the cornice; the dining-room is two feet higher in the centre than at the sides, having a groined ceiling; or showing the entire structure of the roof. The chamber plan, fig. 1474, contains a sitting or dressing room, *i*, communicating with the best bed-room, *h*; two bedrooms, *k*; and a nursery, *l*.

1473



1761. *Construction.* The walls are supposed to be of brick, either covered with cement, and coloured to imitate weather-stained stone; or of brick stained in imitation of the effects of time. All the exterior timberwork is supposed to be either oak, or well-seasoned deal painted in imitation of that wood; and the covering of the roof should be tiles. Fig. 1475 is an elevation of the entrance font. Fig. 1476 shows the barge-board and pendant of the entrance front. Fig. 1477 shows the corresponding barge-board of the garden front. Fig 1478 is a facsimile of the gable of a house at Ypres, in Normandy, taken by the Architect, and intended occupier of this house, which it is proposed to imitate on one of the end gables.

1474

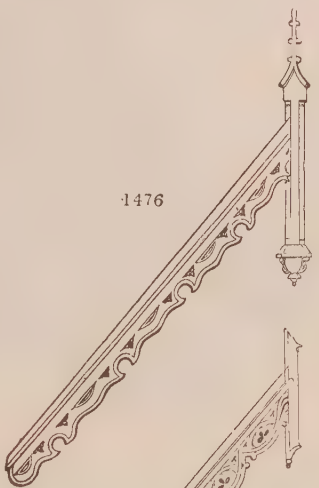


1475

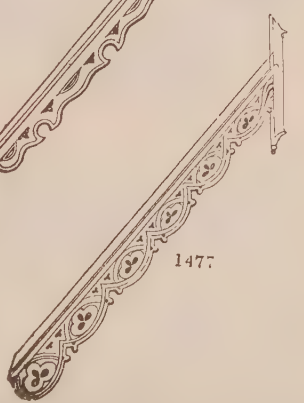
1762. *General Estimate.* Cubic contents, 91,896 feet; which, at 6*d.* per foot, amounts to £2297 : 8*s.* If the external Gothic ornaments were added, the expense would be increased by at least £100.

1763. *Remarks.* This Design was furnished us by William Frome Smallwood, Esq., a young Architect of great taste; who has devoted his attention chiefly to the Gothic style, and who has lately spent a considerable time in Normandy and the Netherlands, delineating the antiquities of those countries. Mr. Smallwood intended to erect this cottage for himself; and the villa-like arrangement of the interior, and the highly enriched Gothic of the elevation, evince the great elegance of his taste. The first villa-like feature, speaking with reference to the ordinary construction of buildings of this size about London, is the largeness of the hall. Every body knows, that, in houses with even double the accommodation here shown, the entrance is commonly into a narrow passage or lobby, generally serving also as a place for the staircase. The effect of this upon a stranger is to show want of ease and ample means on the part of the occupant; and consequently to indicate that he cannot belong to that class of society, whose means are comparatively unlimited, and whose taste, being unrestrained by considerations of expense, is supposed to be good. Perhaps it may be said, in defence of these narrow-entranced small houses, that they are suited to the fortunes of their occupants; and are therefore more true to nature, than any attempts at a style which properly belongs to men of greater wealth. We allow the force of this argument; but, at the same time, we feel that the source of all improvement has its origin in the desire of individuals to better their condition; and we consider that individual to be higher in the scale of worth, who endeavours to raise his taste, and give evidence of it to his friends and the world, than he who merely endeavours to increase his wealth. We therefore cannot but approve of displaying this taste, in a preeminent manner, on houses, gardens, furniture, and every thing connected with home. But, if this may be said of builders of houses in general, how much more might be said of an Architect, who builds his own house, and who is unquestionably bound to set an example to the public! The second feature which we shall notice in this Design is the ceiling of the dining-room being open to the roof, which affords a fine opportunity for an Architect to display his knowledge of the principles of dynamics, as well as of the characteristic features of the different varieties of Gothic Architecture. The barge boards for the entrance and garden fronts, and the small dormer window, are of highly appropriate beauty; that for the end is not less curious, and, if executed, would at once be a standing memorandum of the Architect's taste, and of his travels.

1476



1477



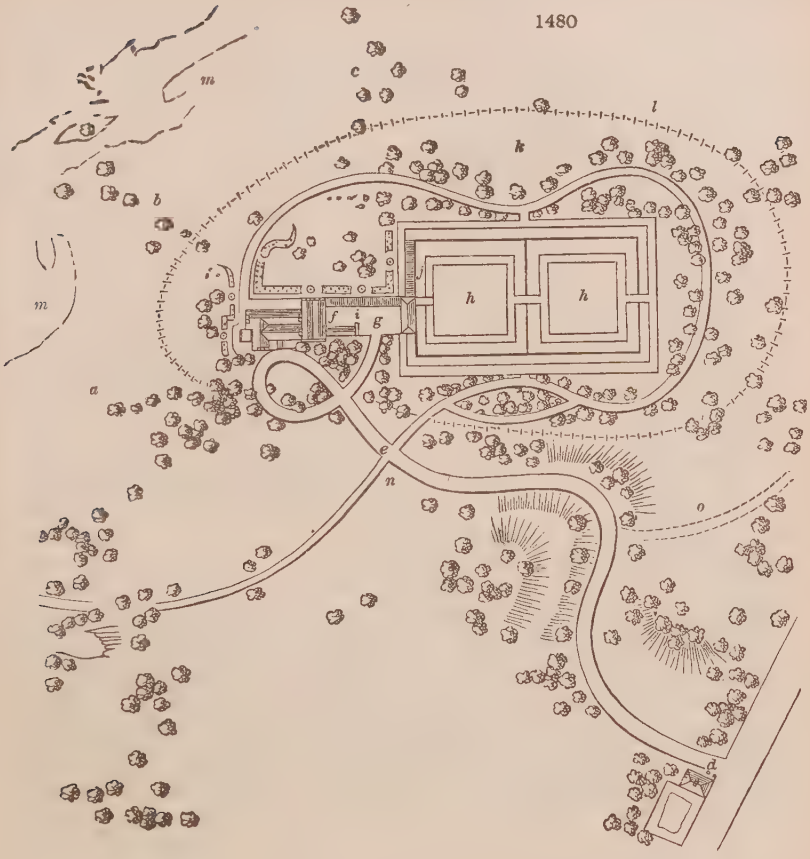
1478

Design VII. — *A Villa in the Old English Manner, adapted to a gently elevated Situation, with good Views on three Sides.*

1764. *The Situation* of this villa is supposed to be at a moderate distance from a town, on a surface rather elevated than otherwise; and commanding views of the surrounding country in at least three different quarters, as from *a* by *b* to *c*, in fig. 1480. The

1479

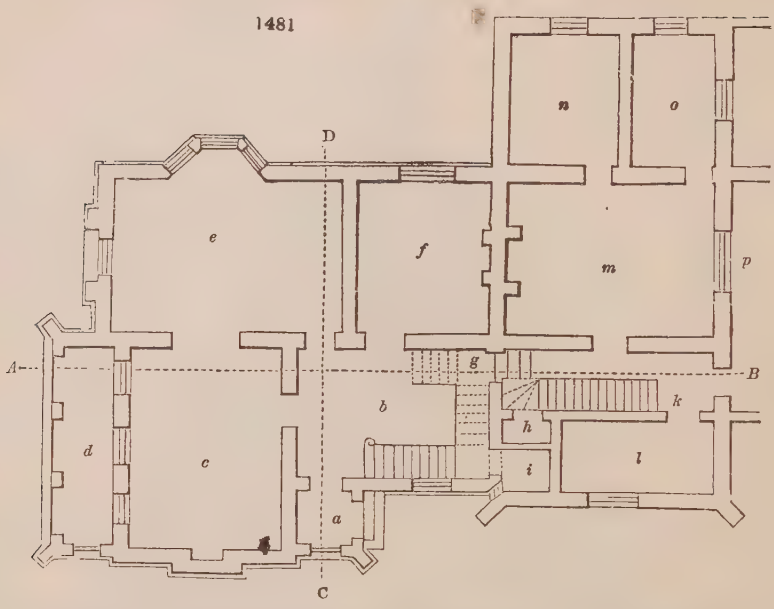
1480



approach road, *d*, should, in this case, as in most others, enter the grounds on the side next the offices; a distant glimpse of the house, bosomed in wood, may be seen from *d*; and a complete view, somewhat similar to that given in fig. 1479, at *e*; *f* is the kitchen-court; *g*, the stable-court; *h*, the kitchen-garden; *i*, a glazed veranda leading to it; *j*, hot-houses; and *k*, the pleasure-ground, bounded by a wire fence shown by the dotted lines, *l*. A great addition to a place of this sort would be a zone of water in the direction of *m m*, to serve as a foreground to the distant scenery; and, when once it shall be thought worth while to make the most of situations for villa residences, and to study beauty rather than extent, water will be raised from deep wells, or distant streams, by means of steam and machinery, for this and similar purposes. Wherever water is introduced, it must never be forgotten that its effect depends almost entirely on the wood with which it is accompanied: there is hardly such a thing in nature as water beautiful by itself alone. Besides the walk round the pleasure-ground, there is an open walk through the park; which, proceeding from the pleasure-ground, crosses the approach at *n*; and, after going through the most beautiful parts of the grounds, re-enters the approach at *o*.

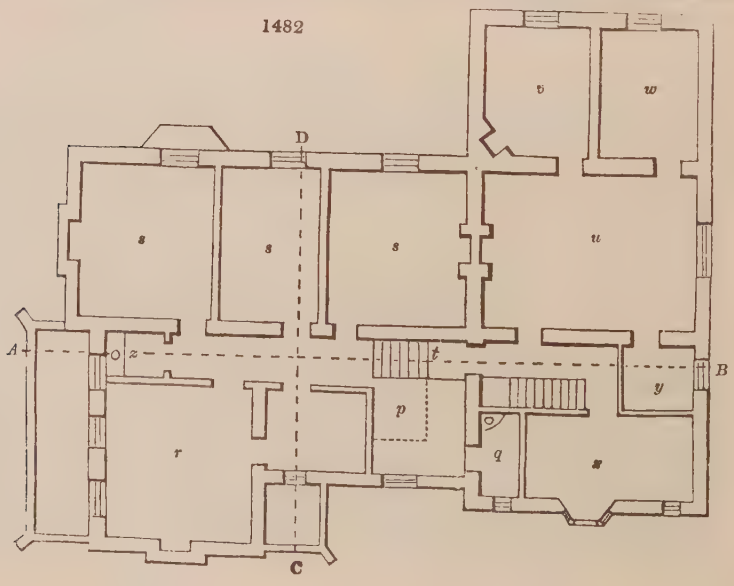
1765. *Accommodation.* The ground plan, fig. 1481, contains an entrance porch, *a*, with a window, which in summer can be taken out; a hall and staircase, *b*; a dining-room, twenty-two feet by sixteen feet, and twelve feet high, *c*; a green-house, *d*; drawing-room, twenty-five feet by sixteen feet, and twelve feet high, *e*: in this room the fireplace has a window over it, as appears by the section C D, fig. 1484. There is a library, sixteen feet by fourteen feet, *f*; and this completes the principal part of the house. The offices are in a building, the floor of which is eighteen inches lower than that of the hall,

1481



and the general proportions of which are less lofty than those of the living-rooms and family apartments. There is a screen across the hall, under the stair at *g*, opening to the door of the kitchen-passage, which commences by a descent of three steps seen at *g*, in the section, A B fig. 1483. There will thus be double doors between the kitchen and the hall, which will effectually prevent the entrance of smells from the former to the latter There are a small closet at *h*; a water-closet at *i*; and a stair to the cellars at *k*: *l* is a butler's pantry; *m*, a kitchen; *n*, a beer-cellar; *o*, a pantry; and *p*, the kitchen-court. The chamber floor, fig. 1482, shows the well-hole of the stair, *p*; water-closet, *q*; the best bed-room, with dressing-room adjoining, *r*; three good bed-rooms, *s s s*; descending

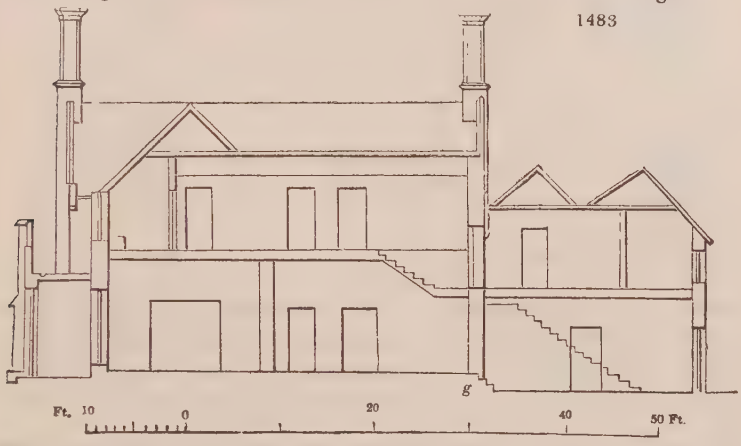
1482



steps to the servants' passage, *t*; nursery, *u*; maids' bed-rooms, *v*, *w*; man's bed-room, *x*; closet to the nursery, *y*; and ladies' water-closet, *z*.

1766. *Construction.* The walls are supposed to be of brick, eighteen inches thick, and the roofs slated. The chimney-tops, and other stone-like finishings, to be formed of cement. Fig. 1483 is a section on the line A B, in which the relative heights of the

1483



different floors may be observed. Fig. 1484 is a section on the line C D. Fig. 1485 is an end elevation, showing the window over the fireplace, and the front of the green-house; and fig. 1486 is an elevation of the entrance front, in the chimney of which there may also be a window, if the prospect from it is worth displaying from the dining-room; which, in a villa of this description, is generally the living-room.

1484

1767. *Remarks.* This villa, which has been executed, is the contribution of Charles Fowler, Esq. (the distinguished Architect of Covent Garden and Hungerford Markets, and of the magnificent conservatories at Syon). Mr. Fowler is so well satisfied with the plan of this villa, that he informs us, were he to build a country-house for himself, he should adopt it as a model. The entrance at once to a large hall has a good effect, and immediately stamps the house as the abode of gentility; and the architectural green-house strengthens the same idea. The hall, at the same time that it confers so much character, is useful as containing the staircase. By having the kitchen and all the offices in a separate building, the height of the rooms, and of the doors and windows, is not required to be so great as that of the principal part of the house; by which a con-

1485

1486

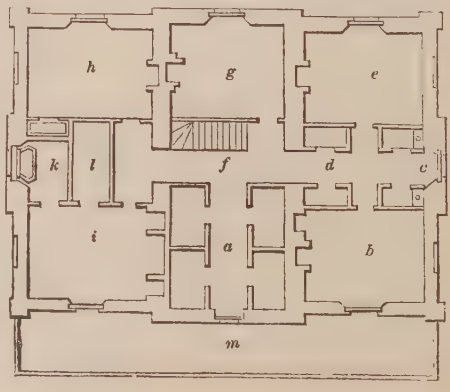
siderable saving in building is effected. The door to the screen at *g*, in fig. 1481, and at the head of the stairs, in the same figure, will effectually exclude all sounds and smells. It is proposed to have cellars only under the hall and library; but these may be extended if thought necessary. The kitchen-court and stable offices for this villa have not been sent by Mr. Fowler; but they may be formed on the plan of some of those already given, or to be given, in this department of our work.

Design IX. — *The Villa of Hannayfield, the Residence of —— Hannay, Esq., in the Neighbourhood of Dumfries.*

1768. *The Situation* of this house is on the face of a bank, sloping to the west, at the bottom of which is the vale of Nith, and at the top an extensive tract of table land. The approach ascends from the public road, along one side of the grounds, through a plantation which conceals the house: when it arrives, by a winding course, at the top of the bank, it turns to the right, so as to enter from what may be called the back front. The area before the entrance floor is raised nearly to a level with the principal floor on that side; while, on the other side, the kitchen floor appears entirely above ground. Fig. 1489 will give a general idea of the situation of the house, *a*; relatively to the approach, *b*; the public road, *c*; the sloping bank from the west front, *d*; and the level platform on the entrance front, *e*. The stable offices are shown at *f*; *g* is a path, partly under ground, between them and the house; *h* is the walk to the kitchen-garden; and *i*, the back way to the stable offices. Fig. 1487 shows the general appearance of the building, independently of the surrounding scenery, as seen on coming up to the entrance front.

1487

1488

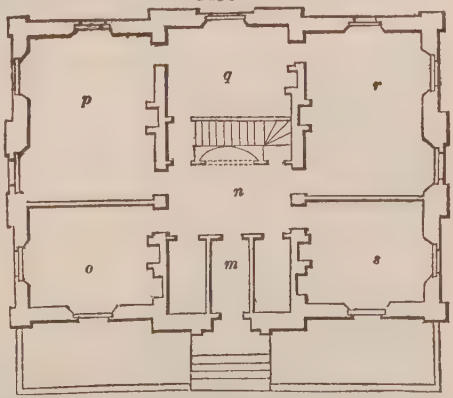


1769. *Accommodation.* The ground floor, fig. 1488, shows a servants' entrance, *a*, with two large closets on each side; a laundry, *b*; two water-closets, *c*; two linen-closets, *d*; housekeeper's bed-room, *e*; stairs to

1489

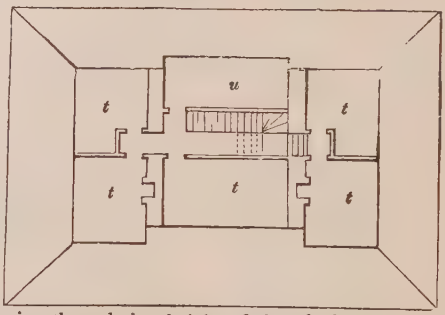
the principal floor, *f*; housekeeper's sitting-room, *g*; bath-room, *h*; the bath being placed in the scullery, for the convenience of supplying hot water, and the opening to it being into the bath-room; kitchen, *i*; scullery, with cistern and sink, *k*; pantry, *l*. From the area, *m*, under the made ground, there are coal, wine, beer, and other cellars, a water-cistern, and a man-servant's water-closet. Fig. 1490 is a plan of the principal floor, showing the main entrance, *m*; vestibule in the centre, lighted from the roof, *n*; bed-room, *o*; dining-room, *p*; library, *q*; evening-room, *r*; bed-room, *s*. There are two large closets on each side of the entrance, one of which is a water-closet, and the other a place for keeping hats, sticks, and shoes; both being lighted from the vestibule: there is another closet under the stairs. Fig. 1491 is a plan of the upper part of the roof, in which are shown five small bed-rooms, *t*; and a lumber-room, *u*. The roof over these rooms is flat, and covered with lead; and there is a staircase to it with a trap-door. The flat part of this roof is surrounded by a

1490



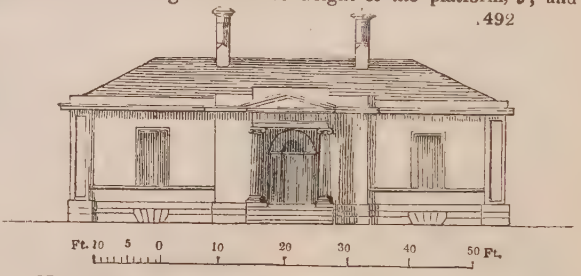
slight iron railing; and benches are placed on it for enjoying the prospect down the vale of Nith, and over Dumfries, towards the mountainous interior of the county; than which there are few more beautiful views in any part of Scotland.

1491



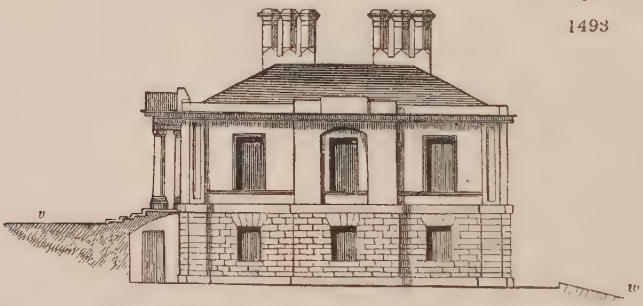
1770. *Construction.* The walls are of pale red sandstone; the lower part rusticated, and the upper part smoothly polished, and set in putty. The workmanship of the whole is of the very best description. Fig. 1492 is an elevation of the upper part of the entrance-front, showing the height of the principal floor, above the level of the platform on which it appears, on entering, to stand. Fig. 1493 is an end view, showing the relative height of the platform, *v*; and the sloping lawn on the garden front, *w*. Fig. 1494 shows the transverse framing of the roof, with the bed-room, *t*, and the lumber-room, *u*. Fig. 1495 is a longitudinal section, showing the framing of the roof.

1492



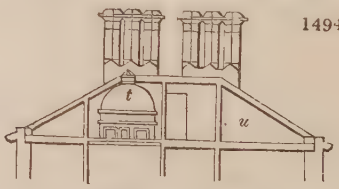
1771. *Remarks.* This villa, which was designed by Walter Newall, Esq., and executed under his superintendence, is

1493

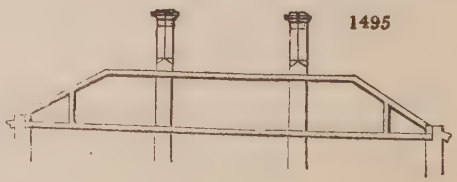


replete with comfort, convenience, and even luxury. In the summer of 1831, we went over every part of it, with the owner and Mr. Newall, and were much gratified with the substantial manner in which the whole was executed, and with the high style of finish of the different rooms. The effect of the views from the windows of the three principal rooms is a good deal injured, in the eyes of a stranger at least, by the want of trees, or even evergreen shrubs, such as hollies and laurels, to the right and left of the entrance front. We have shown in the plan how these ought to be disposed; but, in the reality, there are no trees within twenty or thirty yards of the house, in any direction. The

1494



1495

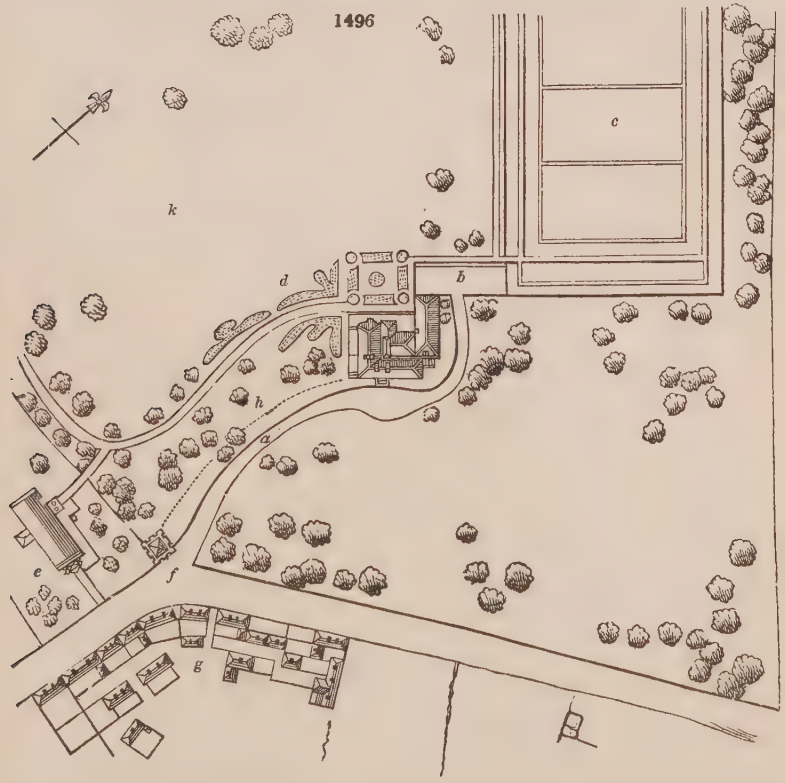


consequence of this is, that the stranger, on arriving at the point of the approach, *b*, in fig. 1489, obtains a view of the house, much as it appears in fig. 1487, with the magnificent prospect beyond, which he ought not to have seen till he was ushered into the library, or the drawingroom. If the situation were low, there might be some excuse for not planting trees so near the house; but it is high and dry; and therefore there is none but what we consider to be want of good taste. The dignity of the house is much lessened by this deficiency in its accompaniments, which, fortunately, however, can be very easily remedied from the large hollies and laurels now growing in the adjoining plantations. In fig. 1489, we have taken some liberties with the line of approach and the situation of the stables, which, like the disposition of the trees, is done more with a view of showing what we think ought to be, than what is. Mr. Hannay was his own landscape-gardener.

Design IX. — *A small Villa, or Parsonage, in the Italian Style.*

1772. *The Situation* is supposed to be on a gentle eminence, in the neighbourhood of a small village; and the approach to be conducted to the entrance porch, in the manner shown in fig. 1496; in which *a* is the point from which the house appears,

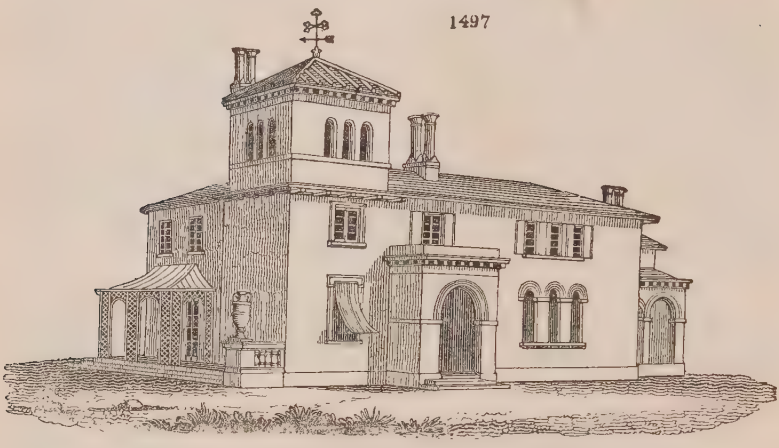
1496



as shown in fig. 1497; *b*, a court, communicating with the stable and the kitchen-garden; *c*, the kitchen-garden; *d*, lawn and flower-beds; *e*, village church; *f*, lodge, serving also as a belfry, and being occupied by the sexton; *g*, the village inn and tea-garden; and *h*, a wire fence, which separates the paddock, *i*, from the lawn, *k*.

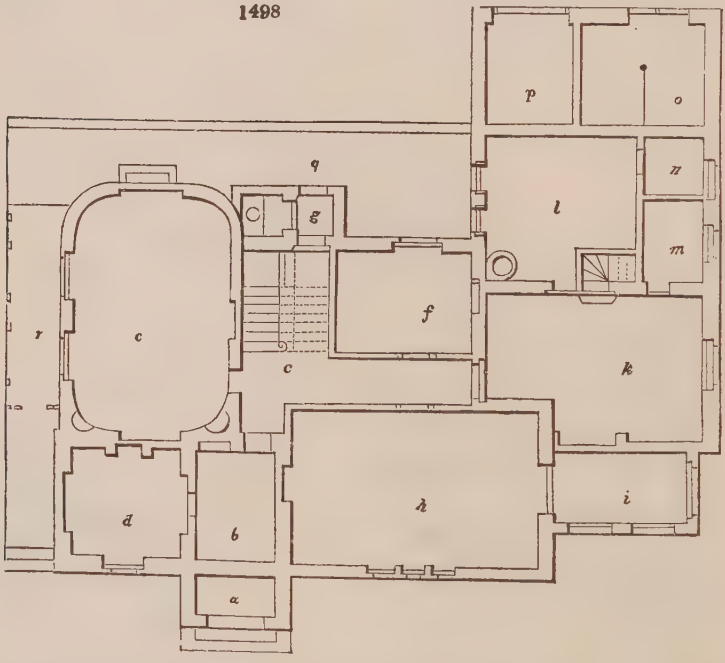
1773. *Accommodation.* The principal floor, fig. 1498, contains a porch, *a*; hall, *b*; staircase and passage, *c*; study, *d*; drawingroom, *e*, twenty-four feet by fifteen feet; breakfast-room, *f*, fourteen feet by eleven feet and a half; porch, *g*; dining-room, *h*, twenty-four feet by fifteen feet; green-house, *i*; kitchen, *k*; scullery, *l*; pantry, *m*;

1497



dairy, *n*; stable, *o*; chaise-house, *p*; open terrace, *q*; and terrace with a veranda over, *r*.

1498



1774. *General Estimate.* Cubic contents, 61,587 feet; which, at 9*d.* per foot, is £2309 : 10*s.* : 3*d.*; at 6*d.*, £1539 : 13*s.* : 6*d.*; and, at 4*d.*, £1026 : 9*s.*

1775. *Remarks.* The effect of the whole is good, and the interior arrangement convenient and commodious. There is, no doubt, a good deal of room occupied by the porches, hall, staircase, and central passage: but extension, and not concentration, is a characteristic of the Italian style. On observing the relative position of the different doors and windows, it will be found that the house may be ventilated by thorough draughts in every direction at pleasure. Double doors are very properly shown to the kitchen, to prevent smells from penetrating into the passage; and this effect may be

further aided by a good ventilator, in, or close under, the kitchen ceiling, directly over the fireplace, communicating with an air flue, in close contact with the smoke flue. When there is most cooking, there will be most fire, and, consequently, most heat in the smoke-flue; and this heat, operating upon the air in the air-flue, will increase its draught, and, consequently, the carrying off of smells in proportion. An outer ventilator, or an iron grating, or iron brick, as they are called, see fig. 1499, in the lower part of the side wall, should always be introduced in connection with such interior air-flues or ventilators, in order to increase their action; because, where much air is carried off, much also must enter, in order to supply its place. There should be shutters, or regulating valves, of brass or iron, to both ventilators; the valve for the ventilator close under the ceiling, should have two handles or arms to the centre pivot, to be worked by two strings, as indicated in fig. 1500; or there may be a pulley-wheel affixed to the centre, and an endless cord brought over it, and worked in a pulley rack, like a common window-blind. The green-house is very conveniently and economically heated from the kitchen-fire; we should not object to its being made wider and longer, so as to range with the south and east fronts of the building. The effect of the tower is excellent, and its windows harmonise well with those of the dining-room and the green-house, and with the openings of the porch.

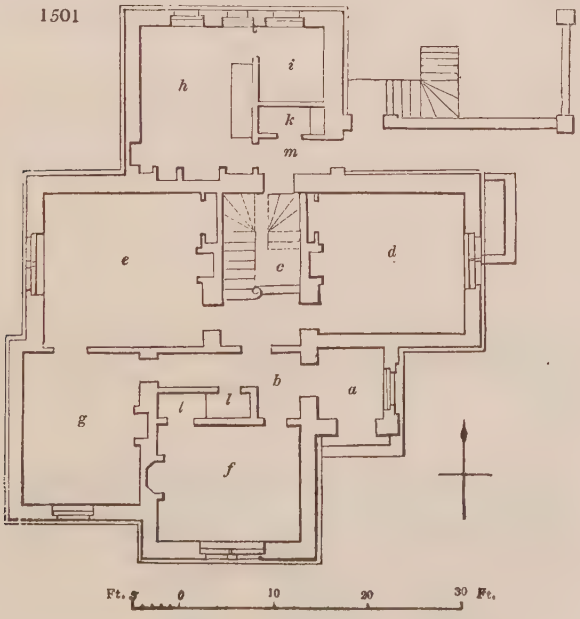
1499

1500

Design X.—*A Cottage Villa, showing how Advantage may be taken of a sloping Bank.*

1776. *Accommodation.* The general appearance is given in fig. 1502; fig. 1501 shows the ground plan of the principal floor, which contains a porch, *a*; an entrance lobby, *b*;

1501

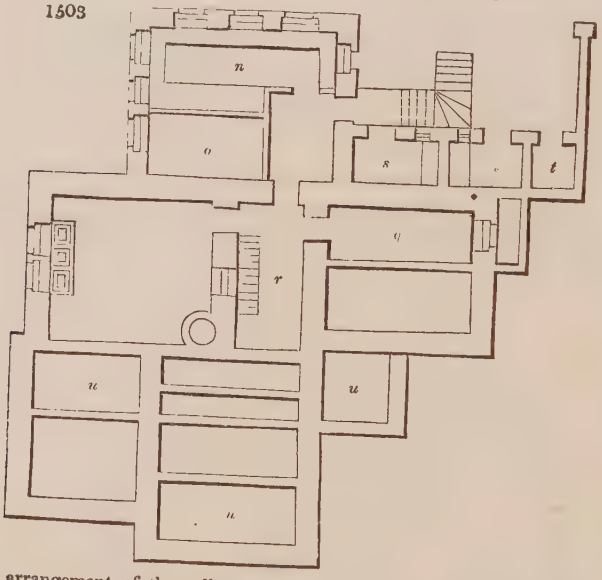


staircase, *c*; dining-room, *d*, 18 feet by 16 feet 6 inches, and 12 feet high; drawing-room, 19 feet and a half by 17 feet, *e*; business room or library, *f*; sitting-room, *g*; kitchen, *h*; servants' room, *i*; water-closet, *k*; closets fitted up with shelving, *l l*; and

1502

back entrance, *m*. The chamber floor may be divided in a similar manner into bed rooms and a nursery; there being no rooms over the kitchen department. Fig. 1503

1503



shows the arrangement of the cellar floor; in which *n* is a milk-house; *o*, a cellar for potatoes and other roots; *p*, laundry, with trays instead of tubs, a boiler, and space for a mangle, &c.; *q*, a coal-cellar; *r*, staircase; *s*, privies; *t*, dust-hole; and *u*, foundations.

1777. *Construction.* Fig. 1504 is a front or southern elevation, showing the entrance

1504

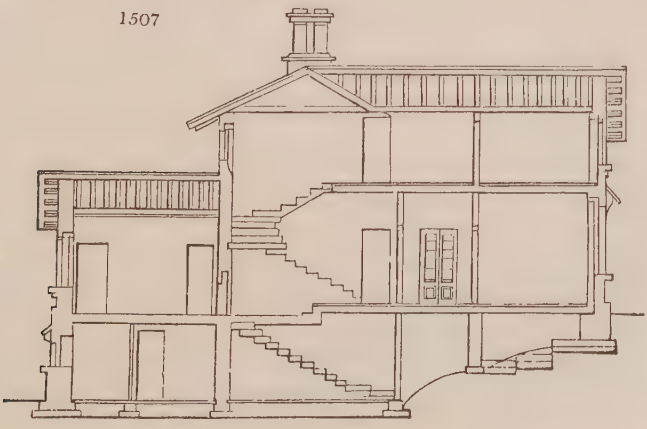
1505

porch. Fig. 1505 is the northern elevation, showing the terrace wall, with stairs down from the terrace, &c. Fig. 1506 is the western elevation, with a section of the sloping

1506

bank; and fig. 1507 is a section from the north to south, through the staircase, looking east.

1507



1778. *Abridged Specification.* The walls are supposed to be of rubble building, 2 feet thick, above the level of the cellar floor, having droved base courses, 21 inches deep, and droved string-courses at the eaves, and coins at all angles. The windows to have droved facings round them, with jutted (projecting) sills and blocks, and projecting slabs, where shown. The chimney-stalks to be droved, having moulded plinths and cornices. The walls above the level of the base course to be rough-cast; and below that level to be of hammer-dressed coursed rubble; which will form a contrast, and give the effect of a level basement to the main part of the building. All apartments and passages, &c., in the ground or cellar floor to be laid with droved pavement, 3 inches thick, closely jointed, and well bedded in sand. The kitchen, staircase, entrance lobby, and porch, to be laid with polished (rubbed) pavement. The stair to the cellars, and the outside stair, to be droved; the steps to be checked down on (notched into) each other and having sufficient overlap. The stair to the bed-room floor to be polished with moulded nosings. The staircase, as well as all the apartments where paved, to have stone skirting 7 inches deep. All the remaining floors to be laid with 6-inch battens, grooved and tongued $1\frac{1}{4}$-inch thick, resting on strong joisting. The roof to be formed of rafters 7 inches by $2\frac{1}{2}$ inches; ties, 7 inches by $2\frac{1}{2}$ inches; and baulks, 6 inches by 2 inches; and to be covered with $\frac{3}{4}$-inch sarking, closely jointed; having proper ridge and piend battens. The soffit of the projecting part of the roof to be lined with $\frac{5}{8}$-inch deal, 6 inches broad, grooved and tongued. The blocks to be boxed up with $\frac{5}{8}$-inch deal, 4 inches broad on the face. All the stone walls, except those in the cellar floor, to be battened, lathed, and plastered. The internal partitions, where not of stone, to be formed of brick on bed. All the walls and ceilings to be covered with three-coat plaster; and all the apartments to have neat plain cornices, except the cellar floor, which may have only two-coat plaster, and no cornices. The windows to have $1\frac{1}{2}$-inch frames and $1\frac{3}{4}$-inch sashes, with centre stiles, as shown in the figures, hinged to open; and to have bound shutters and linings, and $6\frac{1}{2}$-inch moulded facings. Doors to be framed, moulded, and sunk-paneled, with 6-inch moulded facings. The door from the porch to the lobby to be glazed in the upper part, and to be in two halves. The milk-house windows to have Louvre (luffer) boarding, as shown, with wirecloth inside; and the walls to be fitted up with proper shelving. All the doors, window linings, and shutters, in this floor, to be of planed deal. The dining and drawing rooms and study to have 10-inch moulded foot base, and marble chimney-pieces, valued each at £12. The other apartments to have plane skirting, 7 inches deep; with wood chimney-pieces, having pilasters, and friezed and moulded shelf. The roofs to be covered with slates, having lead ridges, piends, and valleys.

1779. *General Estimate.* In the neighbourhood of Edinburgh, a villa such as this could be executed for about £650; which, as it contains 51,300 cubic feet, is about 3*d.* per foot.

1780. *Remarks.* For this Design we are indebted to David Cousin, Esq., Architect, Edinburgh. The plan exhibits comfortable accommodation; and though this is obtained at a considerable expense of foundations, yet it must be recollected that the Design is adapted to a sloping surface, and for a country where building stone is abundant, and obtained for little more than the trouble of working it. The elevation, being in no particular style, can only claim attention as an assemblage of architectural lines and forms; and, examined in this point of view, there is nothing of any marked character about it; nothing to find fault with, but, at the same time, nothing to raise emotion. This, however, is no fault of the Architect, who had a different object in view. Plain designs of this kind, when contrasted with designs in particular styles; such, for example, as that for an old Scottish manor-house (Design XV.), by the same Architect, or Smallwood's cottage villa (Design VI.), are well calculated to show the great difference to the cultivated eye between style and no style; or, perhaps, we should rather say, between a marked or decided style and a plain style. A person who had never cultivated a taste for Architecture would perhaps be just as well satisfied to live in Mr. Cousin's cottage as in that of Mr. Smallwood, provided they were equally comfortable within; but very different would be the feelings of a man of cultivated architectural taste, as to which he would prefer. On the other hand, a man who had not cultivated a taste for Architecture, more than a taste for painting, sculpture, or landscape-gardening, and who had little feeling for any of the arts, from either an original deficiency of imagination, or from not having cultivated it, would, in all probability, prefer a plain cottage like that before us; because he would not be able to conceive a sufficient reason for going to the additional expense requisite to raise plainness into style. It is not uncommon, indeed, for persons of this description, talking of a plain house, regularly pierced with windows, and without a single external mark either of style or of elegant enjoyment, to designate it as genteel or gentlemanlike; and perhaps there may be some truth in the remark, if it has reference to the commonplace manners of a man who has the tone of good society, but who

is without talent or intellect. According to the present state of architectural knowledge and taste among the middle classes of Britain, ten persons would prefer building the Design before us, for one who would risk his reputation for gentility by attempting Design VI.

Design XI. — *A Villa in the Modern Style of Architecture, fire-proof, and suitable for a Marine Residence, for the occasional Occupation or the permanent Abode of a small Family of Fortune.*

1781. *The Situation* of this building, its designer, Mr. Varden, states, may be on the north-west of the sea-shore, or on the bank of a large river or lake, the ground sloping gently to the south or east, and the pleasure-grounds reaching to the shore, or the water's edge. The elevation of the ground floor of the house above the surface of the water should on no account be less than ten feet; but twenty feet, or from that to 100 feet or upwards, would be far more desirable.

1782. *Accommodation.* The general appearance is shown in fig. 1508, which is a view taken at a distance of 150 feet from the angle of the building.

1508

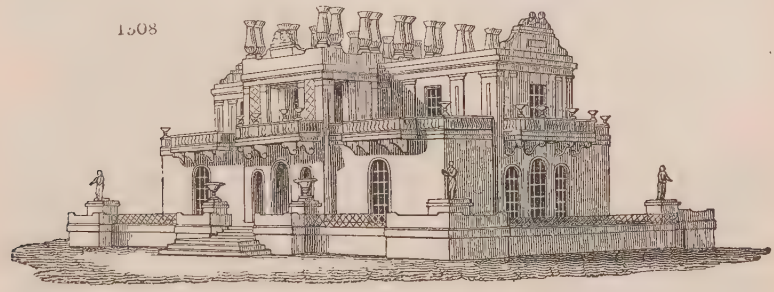


Fig. 1509, to a scale of thirty feet to an inch, is the plan of the basement story, in which *a* is the staircase; *b b b* are passages; *c*, the pantry, eight feet six inches high, and twenty-four feet by ten feet; it is ventilated more effectually than is usual, by having the ceiling pierced in several places, to allow the foul air to pass through, and be conveyed into a vertical flue, like that of a chimney; and so carried up the corner pier of the portico, where it escapes through the shaft; *d* is the dairy, nineteen feet six inches by ten feet six inches, also ventilated by an air shaft; *e*, the footman's pantry, seventeen feet by ten feet, with warm water laid on from the furnace and warming apparatus; and cold water from the cisterns on the roof; *f*, the servants' hall, twenty-one feet by fifteen feet six inches; *g*, the furnace, boiler, &c., for heating the hall, staircase, and passages with hot water; *h*, coal-cellar, eleven feet six inches by ten feet; *i*, the wine-cellar, twenty-three feet by ten feet, with an air shaft for occasional ventilation; *k*, beer-cellar, nineteen feet by sixteen feet, ventilated in the like manner, the beer casks, &c., being brought in from the yard under the terrace by an inclined plane, through the doorway, *m*; *l*, footman's bed-room, twenty-three feet six inches by ten feet, having a fireplace in the corner, the flue of which is carried up the pier of the portico.

1509

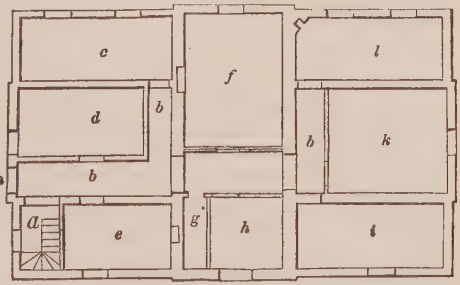
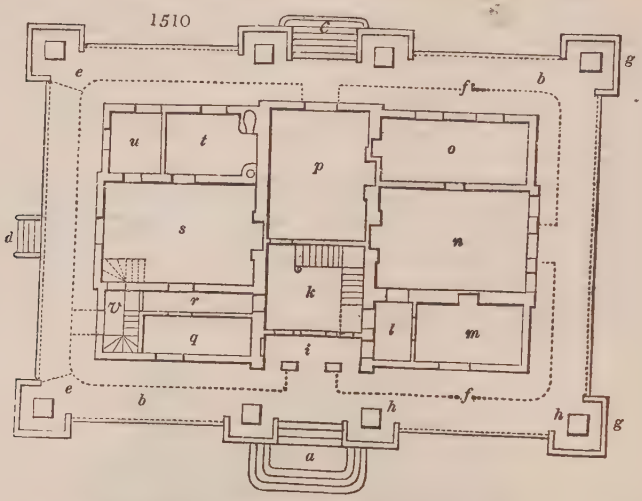


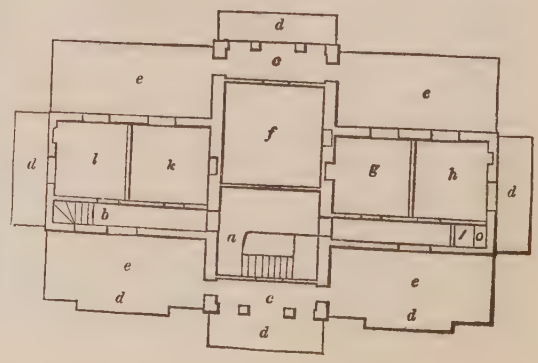
Fig. 1510 is the plan of the principal floor. The main approach to the house is by a flight of steps, *a*, to the terrace, *b*, which is continued all round the building; there is another flight of steps, *c*, on the opposite side, giving access to the garden. A smaller flight of steps, *d*, leads from the kitchen to the offices and stables, and is intended for the use of the servants, and of the tradespeople bringing provisions and articles of daily consumption to the house. The dotted lines, *e e*, represent panels of slight ironwork, to separate the portion of the terrace used by the servants from the part frequented by the family. The terrace nowhere approaches the walls of the building nearer than three feet six inches; that space being absolutely requisite for the area, in order to give light

1510



and air to the basement story. This area is represented by the dotted line *f*. The walls of the projections at the angles of the terrace are of masonry, fourteen inches thick; and each of these projections forms a portion of a square, the external dimensions of which are nine feet on the side; *h h* are pedestals for vases and statues. The vestibule, fifteen feet nine inches by four feet, is shown at *i*; in its external wall are three arched openings, reaching down to the level of the terrace, the centre opening serves as an entrance, but the side ones have each a panel of enriched open cast-ironwork, two feet nine inches high, as a protection from the area; *k*, the hall and staircase. The hall is fourteen feet by fifteen feet nine inches, and the floor of the hall is six inches higher than that of the vestibule or porchway; the geometrical staircase is to be of stone, three feet nine inches wide, with metal hand-rail and balusters. A small lobby, ten feet by six feet, is shown at *l*; it is lighted by a window from the vestibule. The morning or lady's work room, *m*, is seventeen feet by ten feet, and eleven feet high; the window is to the west, because this apartment will be occupied only in the early part of the day, and, consequently, the afternoon and evening sun shining on it will not occasion any inconvenience. The fireplace is on one side of the room, and "the flue is carried up in the wall over the drawingroom door into the wall against the staircase, and so up to the shaft." The drawingroom, *n*, is twenty-four feet by sixteen feet, and eleven feet high; the windows, three in number, are to the south. The library, *o*, communicates with the drawing room, and is twenty-three feet by ten feet, with two windows to the east. The dining-room, *p*, is twenty-one feet by sixteen feet, and eleven feet high, with the window to the east. In the ceiling of this room there are to be ornamental pateras for ventilation, as there is to be an air flue provided for carying off the heated air; the store-room, *q*, is seventeen feet by six feet, with an air flue and pateras in the ceiling; *r* is a passage; *s*, the kitchen, twenty-four feet by fifteen feet nine inches, with an air flue to carry off the steam; *t*, the scullery, fourteen feet six inches by ten feet, containing an oven, and copper, also ventilated by an air shaft; *u*, the larder, ten feet by eight feet; and *v*, the back staircase, constructed of stone, with metal balusters and handrail. The stairs break into the kitchen, but at such a height as not in any way to be inconvenient. For the purpose of getting additional

1511



headway, the flat roof over the staircase is raised about one foot six inches above the rest; but this will not be observable from below, on account of the balustrading.

Fig. 1511 is a plan of the chamber floor; in which *a* is the principal staircase; *b* is the back staircase; *c c*, porticoes; *d d*, galleries; *e*, the flat roofs; *f*, bed-room, sixteen feet by fifteen feet six inches, and ten feet high; *g*, bed-room, twelve feet by twelve feet; *h*, bed-room, twelve feet by twelve feet: this room is to have a small fireplace, the flue of which may either be concealed by the blocking course, or may terminate ornamentally at the corner of the end wall, but in the latter case there must be a false flue on the opposite side, to preserve uniformity; *i*, water-closet; *k*, bed-room; and *l*, servant's room, twelve feet by twelve feet, with a fireplace like that of *h*. Another bed-room might be obtained where the front portico now is, by an alteration of the staircase; but, as the men-servants are supposed to sleep over the stables, it would seldom be requisite. Either of the bed-rooms might be converted into a dressing-room, by opening a door of communication with the adjoining chamber.

1783. *The Stable and other Offices* belonging to this villa are supposed to be placed at the distance of about 100 yards from it; they are shown in detail in fig. 1512, to a scale

1512

of thirty feet to an inch; *a* is a knife and shoe house; *b*, pigsties; *c*, potato-house; *d* fruit-room; *e*, seed-room; *f*, tool-shed; *g*, conservatory; *h*, dung-pit; *i*, stable; *k*, harness-room; *l*, bin-room; *m m*, coach-houses; *n*, brew-house; *o*, dog-kennel; *p*, kitchen-garden; *q*, drying-ground; *r r*, poultry-houses; *s*, cow-house; *t*, fuel-house; *u*, laundry; *v*, carriage-road; *w*, yard; and *x*, pleasure-ground. In the centre of the yard there may be a space enclosed for a hay-rick, and this rick may be built on a stone basement, and under a roof supported on pillars; the roof being carried so high as to form an ornamental tower, and central point to the picture of the offices, when seen at a distance. The basement on which the rick is placed may be raised on stone or cast-iron pillars, so as to leave a space underneath for poultry to run under during rain. On one side of this small rick-yard there ought to be a pump, with a basin to contain water for the aquatic fowls; unless water should be laid on from some elevated source, in which case the pump may be dispensed with.

1784. *Construction.* Fig. 1513 is an elevation of the entrance front of the marine villa.

1513

Fig. 1514 is the garden front.

1514

Fig. 1515 is an elevation of the south end.

1515

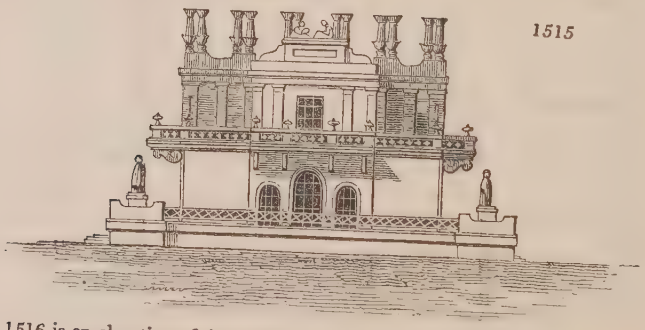
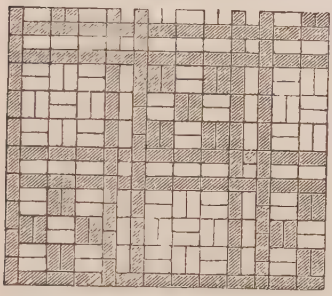


Fig 1516 is an elevation of the north end.

1516

1785. *The Walls of the Building and of the Terrace* are to be of brick, faced with wrought stone; or, if that should be considered too expensive, good picked grey stocks may be used, with stone dressings. The terrace may be paved with rubbed Yorkshire stone, with landings at least six inches thick to cross the area; but the effect of the whole building will be much increased if tessellated pavement is used instead of stone. This kind of pavement may be produced by the use of bricks of different colours; for example, of red bricks and grey stocks, disposed so as to form patterns in the manner exhibited by the thirteen Designs shown in figs. 1517 to 1529. The floor of the hall and passages, and

1517



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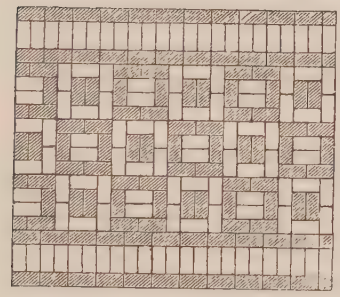

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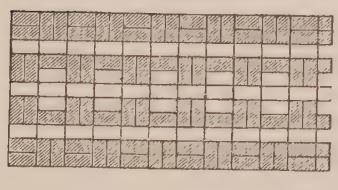

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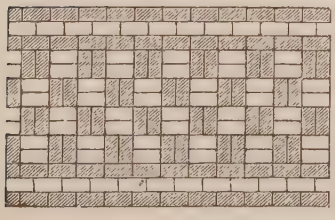

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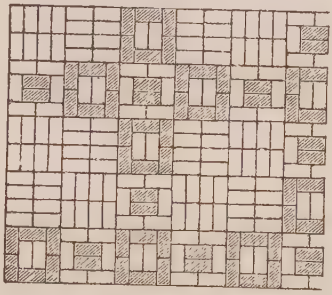

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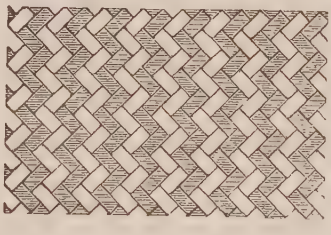

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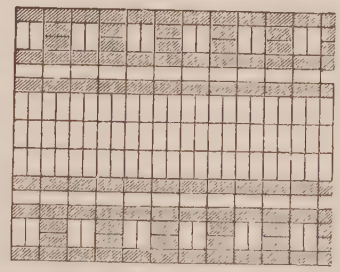

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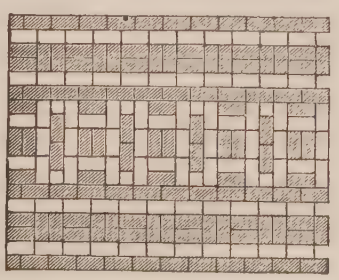

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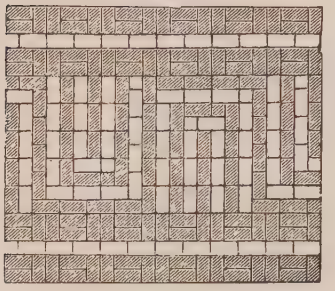

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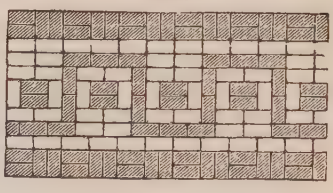

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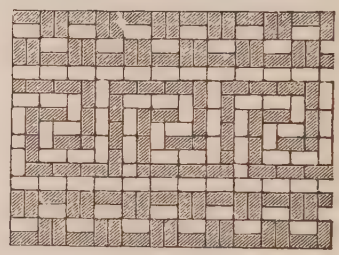

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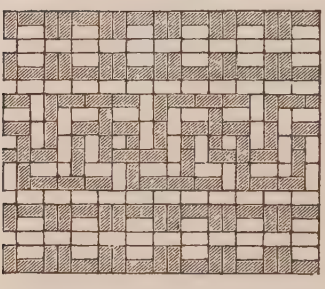

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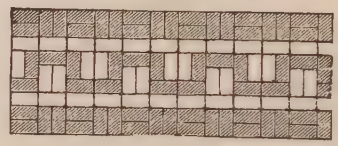


the flat over the library, &c., may be laid with tessellated pavement, or with the ornamental quarries, or paving tiles, of Mr. Wright of Shelton, near Newcastle under Line, Staffordshire; of which we shall give some account, accompanied by figures, when treating of the finishing and fitting up of villas. The vases at the front and at the garden entrances are to be of baked earth or artificial stone, and the statues either of artificial stone or of marble. If the cost of the latter material be objected to, terra cotta or Austen's artificial stone may be employed, as both are of moderate expense, and stand well in the open air. Should it be preferred, however, vases of a larger size than those near the entrance, and of a different form, may be substituted for statues. The small vases on the piers of the balustrading are to be of baked earth; the sculpture group in the centre of the elevation is to be of stone; and the latticework of the portico of wood, painted stone colour. The piers, &c., of the upper walls are to project four inches and a half; and all the semicircular-headed openings are to have architraves round them. The iron railing of the terrace is to be according to fig. 1530, to a scale of one inch to a foot, though a plainer sort is shown in the elevations, in order to prevent confusion in the drawing.

1786. *To render the Villa fire-proof*, various plans may be adopted. We shall first describe one suggested by Mr. Varden, and shall afterwards give some others.

1787. *Mr. Varden's Plan.* "It appears probable that common fir or oak joists with their lower edges chamfered, and coated over with a mixture of alum, black lead, clay, and lime, or some similar composition, would (if closely floored above with earthenware tiles, bedded all round into the plastering, the joists being made air-tight) resist the action of flames, at least for a considerable time. Fire could not descend through such a flooring so as to communicate with the rooms below, till the tiles used in it had become red hot neither could it ascend until the tiled floor above gave way from the burning of the joists; which, if coated as proposed, would not take fire from below, till the tiling over them acquired a sufficient heat to cause the distillation of the turpentine from the wood. In general, there is not furniture enough of a combustible nature in any room to do this. The battening against the outer walls might be of larch, as that wood burns less freely than most others; but if the walls were brick, or lined with brick, battening of any kind will be unnecessary. If this plan should be thought likely to answer the end proposed, houses built in the common manner might be altered at a moderate expense, by taking up the

boarded floors, and substituting earthenware tiles, plain or ornamented, according to the character of the house.

1530

1788. *Mr. Frost's Plan for constructing fire-proof Buildings* is, to form the floors of hollow earthenware tubes embedded in cement, and combined in such a manner as to be, in effect, one artificial flag-stone of the size of the room. These hollow tubes, for which Mr. Frost took out a patent some years ago, are square in the section, about an inch and a half on the side externally, with a tubular space of an inch and a quarter on the side internally. They are formed of brick earth, prepared in a superior manner, and pressed through moulds by machinery. The tubes are each about two feet long; and the mode of forming a floor or roof of them is as follows: — The centring, after being prepared and fixed in the usual manner, is first covered with a coating of cement of a quality sufficiently fine to form the ceiling of the apartment to be floored over; and, if it is desired that there should be mouldings or ornaments in this ceiling or its cornices, moulds for them can be placed in the centring, so as to form a part of it. One, or, in some cases, two coats of cement being laid over the centring, a stratum of the square tubes, laid side by side, and breaking joint, is next to be bedded in fine cement, and the interstices between them also filled in with that material. One thin coating of cement is then laid over the whole stratum; and, in a week, when this is dry, another stratum of tubes is laid over the first, in a contrary direction, bedded and filled in with cement as before, and finished by a coating of the same material; which, when dry, may have a second coating to serve as the floor of an apartment, or the covering of a roof, as the case may be. Where the space to be covered is not wider than ten feet, Mr. Frost conceives, and indeed has found upon trial (at a house, No. 6, Bankside, London, where he resided when he explained to us his process), that two strata of tubes would be sufficient; but for greater widths he would employ three, four, or half a dozen strata; or he would introduce iron girders to support artificial flag-stones of less thickness. There can be little doubt of the success of this plan; but, as both cast and wrought iron are now so cheap, a simpler and less expensive mode is to tie cast-iron or stone abutments together with wrought-iron rods, and to form the flooring or roofing between by four-inch brick arches, or layers of plain tiles bedded in cement. Flat roofs and floors of immense strength are formed in this manner, in and about London. Near us, at Bayswater, there is a public house with a flat roof so formed, which, on Sundays and other holidays, is crowded with guests; and a veranda, ten feet broad, with a flat roof formed of two courses of tiles bedded in cement, is brought to a level at top with that material, and supports as many persons as can sit upon it.

1789. *Fire-proof Floors and Roofs formed of Arches of Coombs or Earthenware Pots.* This is an old French invention, described in the *Mechanics' Magazine*, vol. viii. p. 354, as having been adopted in that architectural deformity the new palace at Pimlico. There the arches are formed of hollow pots, as being lighter than solid bricks. These arches spring from stone abutments which rest on the flanges of iron girders placed five feet apart. The length of the cast-iron girders is from twenty to thirty feet. The pots are like flower-pots, but are without rims; they are four inches in diameter at the mouth, and six inches deep outside measure; the diameter at the bottom is such as that, in an arch of five feet span, the rise in the centre may not be more than six inches. The

space above the arches may either be brought to a level, with bricks and cement; or a flooring of ornamental tiles, or marble; or a boarded floor on joists, or in panels without joists, may be formed over it. Where a roof is to be placed over the arches, their haunches may be brought to a level with brickwork; and afterwards covered either with common cement, or, as in the case of the Pimlico Palace, with what is called Lord Stanhope's composition. This is composed of chalk, coal-tar, and sand; and is laid on hot, and gauged to the thickness of five eighths of an inch with a templet made for that purpose. The composition is then smoothed with large heated flat irons; and several coats of it are required. Over the last coat slates are bedded, while it is yet boiling hot. For details, see *Mech. Mag.*, vol. xviii. p. 339.

1790. *To render the commonest Description of Houses fire-proof;* or, at all events, greatly to diminish the risk from fire, two things are requisite: first, to form all staircases of stone, or to have the skeleton of the staircase of ironwork, and the treads of the steps of stone; and, secondly, to avoid having any hollow partitions or floors. A house having a stone or iron staircase, and having all the partitions either of four-inch brickwork, or of brick nogging, in whatever way it might be set on fire, could never be burnt down, if ordinary exertions were made to extinguish the flames; and, at all events, could never endanger human life. One apartment might be set on fire, but before the flames could spread to that under it or over it, or to a staircase adjoining it, the fire might readily be put out. In a house so constructed, there would be no piece of timber that was not in close contact with mortar, at least on one side; and all the strong pieces of timber, such as joists, rafters, quartering in partitions, &c., would be closely embedded in mortar on two sides. Where the partitions could not be made entirely of brick or brick nogging, the interstices might be filled up with a mortar prepared of clay with a small proportion of lime. The same material might be filled in between the joists, and, where it was desired to render the roof fire-proof, the rafters might be made of iron, or the space between wooden rafters might be filled in with this mortar. We are aware that one objection to this practice would be, the greater length of time that newly built houses would require to be rendered sufficiently dry for habitation, and also the risk of decay from dry rot when imperfectly seasoned timber was used; it would also add something to the original cost. All these objections, however, may be considered of minor importance compared with the degree of security which would be thus obtained from accidents by fire. Where the expense of cast-iron girders is an objection, arches of brickwork may be formed, nine inches thick, and of a rise proportionate to the resistance of the walls against which they are made to abut. In the spandrils of these arches, walls may be carried up to such a height as to form, like the girders, abutments for lateral arches, which may be formed of pots, like those before mentioned. This would take the greater part of the thrust of the floor from the side walls, by reducing it nearly to a perpendicular pressure. Were the public fully alive to the importance of having their houses fire-proof, a plan of this sort would very soon be brought to perfection. The panels of all doors and window-shutters in a fire-proof house may be formed of sheet iron, which, kept well painted, would last many years; and the astragals of the windows might be formed of wrought iron, or hollow brass or copper, like those used in hot-houses.

1791. *To render Houses already built comparatively fire-proof*, all the interstices between the floors, in the partitions, and in the roof, where there was a ceiling formed to the rafters, might perhaps be filled in with earthy matter in a state of powder. This powder might be clay or loam mixed with a small proportion of Roman cement; it might be injected into the vacuities, through small orifices, by some description of forcing-pump or bellows, which, while it forced in the powder, would permit the escape of the air; and, while this operation was going forward, steam might be injected at the same time, so as to mix with the powder, and be condensed by it; by which means, the whole mass would be solidified with a minimum of moisture. In short, in rendering houses fire-proof, the next important object to using fire-proof materials is, that of having all the walls and partitions, and even the steps of wooden staircases, filled in with such materials as will render them in effect solid. On examining into the causes of the rapidity of the spread of the flames in London houses when on fire, it will almost invariably be found, that, whatever may have occasioned the fire to break out, the rapidity of its progress has been in proportion to the greater or less extent of the lath and plaster partitions, the hollow wooden floors, and the wooden staircases. Were the occupiers of houses sufficiently aware of the danger from lath and plaster partitions, especially when they enclose staircases, they would never occupy such houses, or, if they did, they would not give such rents for them, as they would for houses with brick-nogging partitions. It appears to us to be the duty either of the general or local government or police to see that no houses whatever are built without stone or iron staircases; and that no partitions or floors are made hollow; or, if they are, that

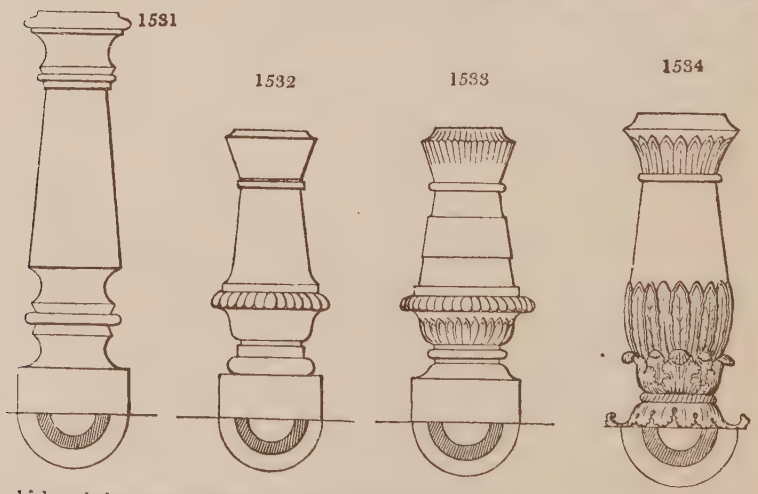
the materials should be iron and tiles, or slates, or stones, or cement, or other earthy composition.

1792. *Any Building might be rendered completely fire-proof* by avoiding the use of timber in every thing, except fittings up and finishing. The floors might be formed of flat tiles and cement, and covered with ornamental tiles; or flooring may be made of composition, and polished in imitation of scagliola, or artificial marble. The roofs might be made flat, and covered in the manner already described, § 1789; and the outer walls of the building might be tied together in all directions by wrought-iron rods made fast to stone bond, as broad as the wall is thick, the stones cramped or dovetailed together, and carried completely round the walls, about the level of the centre of each floor. The netting or latticework of iron rods, connected with this chain of stone bond, being thickly embedded in cement, and cased with strata of flat tiles, would be kept from extremes of temperature throughout the year; so that the difference in their contraction and expansion, during summer and winter, would be of no practical importance. Every floor of a house thus formed, would be, in effect, a single flag-stone, and, as the iron rods would be prevented from oxidising, it would probably last for ages. It is easy to conceive the skeleton of an entire house, thus constructed, the perpendicular supports being brick or stone piers, three, four, or six feet apart; the horizontal bond on these supports, of flag-stone of the width of the intended thickness of the walls or partitions, and all the horizontal floors or vertical panels of iron rods and wires covered on one or on both sides with plain tiles coated with cement. Even the staircases might be so constructed and covered. In the case of the floors of rooms, square or nearly so, there might be circles of thin flat cast iron, laid on the horizontal rods, and made fast to them, which would serve as struts; and oblong rooms might have two or more cast-iron circles, or ovals with plates of cast iron in the direction of their short diameters, to serve the same purpose. The outer walls might have double panels of wrought-iron rods and wires with intervals between, so as to form hollow walls; so that houses constructed in this manner might be rendered equally impermeable by cold or heat as those with thick walls, or with hollow walls of masonry. There would be no objection to houses of this description, having all the doors and windows framed of timber, provided the panels and astragals were filled in with iron. As the iron rods and wires need not be of great diameter; perhaps, in ordinary cases, of half an inch for the rods, and one eighth of an inch for the wires, and half an inch in thickness, with three inches in breadth for the cast-iron circles; the expense, even for the smallest houses, would not be an insuperable objection. Were the attention of the legislature turned to this subject, with the view of protecting those who at present cannot protect themselves, we mean dwellers in town houses of the commoner kinds; the government would probably direct experiments to be made, so as to bring this mode of construction, or some similar mode, to a degree of perfection which would soon render it general.

1793. *Protection against Fire.* Next in importance to the building of fire-proof houses, is the mode of arranging a general system of police for the extinction of fires, both in town and country. On this subject, a correspondent, J. Robison, Esq. Sec. R. S. E., whose letter, dated Feb. 8th, 1833, we have received since we commenced these paragraphs, has the following observations.: — "I have long entertained the idea that the protection against fire is inadequate, though sometimes costly establishments are maintained, as has, until lately, been the case in Edinburgh and London. In Edinburgh, matters have been put on a better footing since the year 1825, and I believe there is now no city in Europe where property is so well protected, or at so small an expense. I have had some correspondence with the last and the present administrations, about a plan for extending a uniform system of fire-engine establishments all over Britain, by forming a regular disciplined corps of firemen at Woolwich, and furnishing officers and instructors from it to provincial corps to be established by the municipal authorities on the spot. I have not succeeded so far as I could wish, but I have made some impression; and the first fruits of it are now developing themselves in your metropolis, where the Insurance Companies have begun to act in concert in getting up a regular corps on the model of the Edinburgh one, and have bribed away the superintendent from this place to put him at the head of it. The connection with the police will follow next, and, when experience shall have shown the truth of what I have urged, some person about the government offices will step forward with the whole of my plan, claiming it as his own, and will, perhaps, get public thanks for it. Provided the plan be adopted, I care but little who gets the credit of it." The most complete fire-police with which we are acquainted is that at St. Petersburgh. It is entirely under the management of the general police there, which, it is well known is a regularly organised body, such as our correspondent contemplates. We passed the winter of 1813 in that city, during which several large fires happened, and were very promptly extinguished. Among other apparatus, we recollect a system of ladders attached to a frame, which could be elevated to any particular point by machinery worked on the

ground. The ladders were slid past one another in the manner of a pocket telescope, and could be elevated to any angle, or projected horizontally. There was also a platform formed by a frame five or six feet square, filled in with wirecloth, which worked on pivots, and could be elevated or projected at any angle with the greatest rapidity; the wirecloth platform, or frame, in consequence of turning on pivots, being always in a horizontal position, for the purpose of receiving those who had no other chance of escape than by jumping on it. These apparatus were invented by a gentleman of the name of Hastie, a Scottish Architect and engineer in the service of the Russian government. Similar, and various other fire engines will be found described in the *Mechanics' Magazine*, and in the very excellent work of Mr. Braidwood on Fire Engines, published at Edinburgh in 1830.

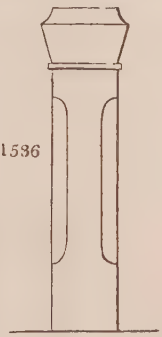
1794. *The Chimneys*, in this Design, Mr. Varden observes, "are all brought pretty much into the centre of the house, and are arranged in two lines, in pairs, at equal distances, with the view of making them ornamental; for, where they cannot be concealed (and it is doubtful if that attempt should ever be made), the only alternative is to make their appearance as agreeable as possible. Our modern Architects have long been endeavouring to do this, though but few of them have succeeded in the attempt; and hence it is, that, in buildings of the present day, the chimney-tops are generally the most unsightly parts of the edifice. This often arises from their terminating too abruptly, and being treated as pots, not as shafts. There are no remains of antiquity that give us any hints on the subject of chimneys; we are, therefore, left to our own ingenuity, which has hitherto, in most cases, proved insufficient. In the old English country-houses, the chimney shafts form one of the most prominent and agreeable features of the style; and there does not appear any reason why the chimneys of modern buildings should not be equally conspicuous and ornamental. Of course, the form must be in some degree altered, in order to assimilate with the style of Architecture; and, whenever there is any attempt at classical effect, perhaps an adaptation of the elegant Roman candelabra would be more suitable than the diminutive altar-like forms we are in the habit of seeing employed for chimney-tops. In the present Design, it has been attempted to exemplify the above principles. The chimney-tops of this villa are to be of cement, of baked earth or artificial stone, or of real stone. Of these materials, cement is the least to be depended upon; as it is generally found to crack, and scale off, after having been exposed to the weather for a few years. Figs. 1531 to 1537 are patterns of chimney-tops, from



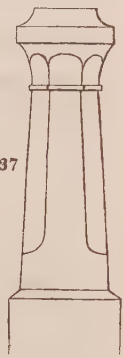
which a choice may be made. In the elevation, fig. 1515, the first flue from the left hand is the air-shaft from the wine-cellar, that passes up the corner pier of the portico: the second flue is for ventilating the hall and staircase; the third shaft is from the chimney of the morning room; the fourth is an air-shaft from the beer-cellar; the fifth is the drawingroom flue; the sixth is the bed-room flue; the seventh an air-shaft from the servants' hall; the eighth is the dining-room flue; the ninth, the dining-room air-shaft; the tenth, the bed-room flue; and the eleventh and twelfth, the flues of the library and the footman's bed-room, both of which pass up the piers of the portico. In the elevation of the north end, fig. 1516, the first shaft from the left hand is the

oven flue, and the second is the air-shaft from the scullery, both of which pass up one of the piers of the portico. The third is the air-shaft from the pantry; the fourth is the flue from the copper in the scullery; the fifth is the flue of the servants' hall; the sixth is the bedroom flue; the seventh and eighth are the kitchen flue and air-shaft; the ninth is the air-shaft of the dairy; the tenth, the air-shaft of the store-room; the eleventh is from the furnace; and the twelfth from the footman's pantry: the last two pass up the corner pier of the portico.

1535



1536



1537

If air-flues should be considered unnecessary, a row of single shafts will be sufficient for the smoke-flues. The walls on which these shafts stand are twenty-two inches thick, to allow of the flues being gathered, that is, inclined either to the right or left, so as to bring them up to their proposed places without disfiguring the rooms. The diameter of the shafts should be ten inches in the clear; that of the flues may be an inch or two larger, and the latter may be lined with earthenware tubes, or built with Chadley's chimney bricks."

1795. *Cisterns*, for containing hard and soft water, to supply the different apartments, may be placed on the roof.

1796. *Columns*, Mr. Varden observes, "are not introduced in this villa, as they cannot be employed with propriety in such small buildings. The bad effect of columns in the porticoes of many villas near London has been frequently noticed by Architects of taste; and the similarity that exists among them is so great, that they look as though they were all bought ready made. The builders seem quite indifferent as to their form or size, or their suitableness to the building which they are designed to decorate. To them a portico is a portico, and whether it is put to a large or a small house, in front or at the side, is of no consequence; the same kind is applied every where, and very frequently with great impropriety. A column, when of a large size, is the most noble feature in Architecture; but the little wooden posts dignified by that name, stuck about some modern English villas, bring the beautiful orders of antiquity into disrepute, without in any way improving the taste of the public, or disseminating architectural knowledge."

1797. *The Entrance Door of a Villa*, says Mr. Varden, "should never be near the corner of the building, for this produces the idea of a badly arranged ground plan. In every case the entrance should be distinctly marked, in order that a stranger may not have to look for it twice: when the spectator has hastily glanced over the whole building, the doorway should be the first thing for his eye to rest upon; and, that this may be the case, it must display stronger contrast of light and shade than any other part of the structure. In the present Design, I have endeavoured to accomplish this by having a vestibule and arches, that must always be in deep shadow, brought into proximity with a projecting gallery that will receive the strongest light; and which, in its turn, is relieved by coming in front of a deep portico."

1798. *When any peculiar feature*, either of form or ornament, is introduced, Mr. Varden considers, "that it should always be in some way repeated, with slight variation, in other parts of the Design; and, if masses of ornament are repeated two or three times, it will generally be advisable to have between them some little enrichment of the like description, for the purpose of connecting the parts, and harmonising the whole. In the present Design, the form of the arches of the vestibule is repeated by the three windows of the drawingroom, but with less depth of shadow, and the window of the morning room serves to unite them. The gallery over the entrance is repeated at the end of the building, and the two are connected by the smaller gallery over the morning room; so likewise the four small vases on the entrance front are repeated on the garden front; the one at the corner being the connecting link."

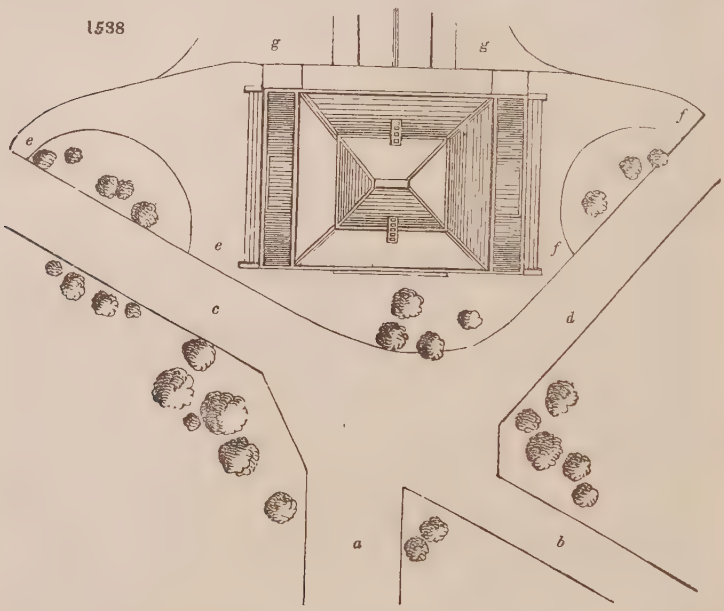
1799. *Remarks.* This Design is very much to our taste. It is highly architectural in its expression, and in every part arranged for comfortable and elegant enjoyment. We highly approve of the mode of ventilating the kitchen offices by flues, which is at

once a most effectual mode, and one which, by giving rise to a number of external pinnacles or chimney-tops, is a source of the very greatest ornament.

Design XII. — *A Double Suburban Villa, adapted for a particular Situation in the Suburbs of Leicester.*

1800. *The Situation* is where four roads meet; the principal road or street, fig. 1538, *a*, proceeding direct from the centre of the town, and three other streets, *b*, *c*, *d*, diverging from it in different directions. There are double carriage entrances to each house *e e*, and *f f*, and a garden to each, *g g*. The general appearance is shown in fig. 1539.

1538



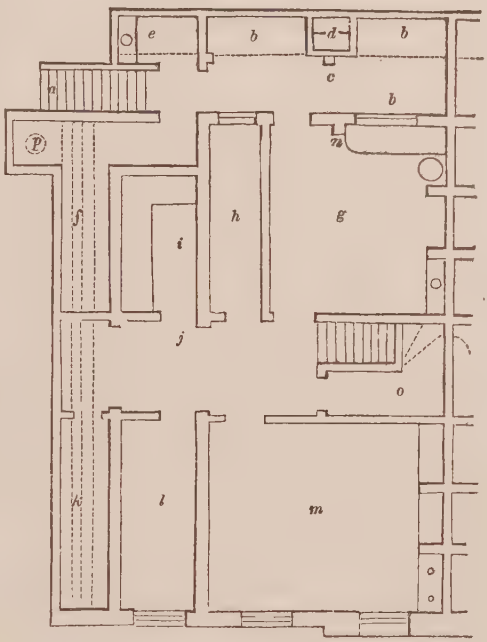
1539

1801. *Accommodation.* The kitchen and offices are in the basement story, one half of which is shown in fig. 1540; in which *a* are steps leading down into the area, the dotted

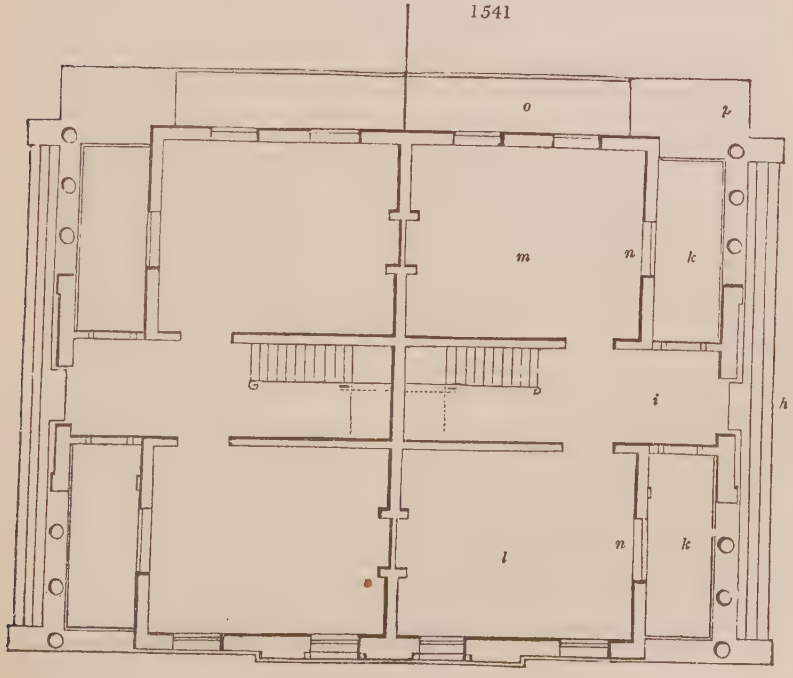
lines at *f k* showing the steps over the entrance front area; *b*, open area partly under the terrace; *c*, situation of a forcing-pump for supplying the cisterns of the water-closets, &c.; *d*, dust-hole under the steps from the terrace; *e*, water-closet; *f*, place for coals, having a projection with a hole over it, *p*, for shooting them down; *g*, back-kitchen; *h*, china and glass closet; *i*, beer-cellar; *j*, passage from the wall lighted from the risers of the steps shown by the dotted lines; *l*, pantry and larder; *m*, best kitchen; *n*, soft-water pump, sink, and boiler, in back-kitchen; and *o*, wine-cellar.

Fig. 1541 is a ground plan of the principal floor of both houses. In this are seen, a broad flight of steps, *h*, supposed to be covered with pots of plants in the summer season, leaving an ascent to the principal entrance, opening into a hall and staircase, *i*, with conservatories to the right and left, *k*; dining-room, *l*, and drawingroom, *m*; both

1540



1541



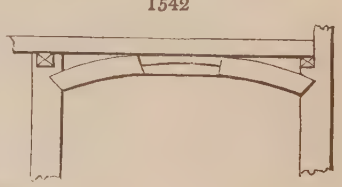
rooms having glass doors at *n*, opening into the conservatories. Each house has a veranda on the south-west side, *o*; and stairs in the area to the kitchen floor, *p*. The conservatories are proposed to be heated from stoves, connected with the kitchen-ranges, by flues passing along the haunches of the arches which form the kitchen ceiling; which flues will at the same time heat the hall and staircase. This Design, which has been contributed by Messrs. Parsons and Gill, Architects, Leicester, was accompanied by the following conditions and specifications: —

Conditions and Specifications for building a Double Villa near to the Town of Leicester.

1802. *Conditions.* The contractor to find all materials, and every thing necessary to complete the building according to the plans, sections, elevation, and specification hereunto annexed; and the various works to be done in the best and most workmanlike manner, and to the satisfaction of the Architect employed to superintend the same. If at any time there should be delivered on the premises any materials whatever, which, in the opinion of the Architect, may be of an unsound quality, or otherwise defective, the same to be immediately removed by the contractor; and, in default thereof, or refusing so to do, the Architect to have the power of causing the same to be removed within twenty-four hours after a notice in writing to that effect, signed by the Architect, has been delivered to him the said contractor, or his foreman, and the expense thereof to be deducted from any money that may be (or may become) due to him upon his contract; and, in case any such imperfect materials shall have been used in the work, the same shall be taken down by the direction of the Architect, and the work perfectly restored, at the expense of the contractor, which expense shall likewise be deducted as aforesaid. If, by the direction of the Architect, any alterations are made in any part of the Design, the same shall not invalidate the contract; but, whether such alteration be an addition to, or a deduction from, the work contracted for, the value thereof shall be ascertained in the usual way, and the amount be added to, or deducted from, the sum total, as the case may be. The contractor to be paid by instalments, in the following manner; that is to say, when he shall have performed work to the amount of £200, he shall be paid such sum, except £10 per cent of the same, and so on in proportion throughout the progress of the building till its completion; and upon its being so completed, half the said sum of £10 per cent shall be paid to the contractor, and the other half shall remain in hand for six months afterwards, as a security against the failure of any part of the work. The whole to be completed by the day of , under a penalty of £10 per week, for every week that shall intervene between that period and that of its actual completion. The contractor will be required to enter into a bond (with two sureties, if required), for the due and proper fulfilment of these conditions, and the following specifications.

1803. *Specifications. — Digger and Bricklayer.* To excavate for the basement story, cisterns, foundation, &c., as shown by the plans and sections, of a sufficient width and depth; afterwards to fill in and well ram the same; to level the ground as directed, and to cart away all spare earth and refuse that may remain on the completion of the works. To sink and steen a well, using the required quantity of oak curbing, with proper well bricks to the depth of 18 yards below the level of the basement floor, which is to be 3 feet six inches within when finished; also to well puddle the same with good and well-tempered clay to the depth of 3 yards, and to cover the same with a rough slab, Swithland quarry. To build all the walls of the respective heights and thicknesses shown by the plans, sections, and elevations, with good and well-burnt common bricks, laid in English bond, and left rough for stucco: those that are not described as to be stuccoed to be neatly pointed. Immediately above the ground line lay three courses deep in Roman cement, well flushed up between the joints (to prevent the moisture from rising into the walls above). The whole of the basement story to be arched over with 4½-inch brickwork, and the kitchens to have 9-inch brickwork, extending 4 feet each way from the abutment. (*fig.* 1542.) To lay the floor of the best kitchen with quarries, bedded and jointed in beaten mortar; also the passage under the hall floor, the back kitchen, the pantry, and the china-closets, with dressed bricks in beaten mortar, as before. The two cellars, shoe-place, coal-hole, and area, to be laid with common bricks bedded in mortar. To build, where directed, a rain-water cistern, 9 feet by 5 feet, and 5 feet deep, to the springing of the arch. When finished, the arch to be of ½-brick, leaving in the arch two openings; one, 2 feet by 1 foot 6 inches, the other, 9 inches square for pump. The walls to be 1½ brick thick, and those with three floors to be laid close in beaten mortar; the walls of the first two floors to be of the best hard-burnt and

1542



picked bricks; the third floor of dressed flooring bricks; and afterwards the whole to have one coat of cement inside. A waste drain to be laid from this into one of the principal drains conveying the water into the main culvert in the street (which, in this case, is below the basement floor), but first a proper stench-trap to be formed. A 12-inch culvert to be laid in cement from the water-closets into the main culvert or sewer; smaller drains intersecting the kitchens, &c., where directed; the whole to enter into one drain in each area, where a proper stench-trap and grate are to be formed. To build in the back-kitchen the necessary brickwork for supporting the stone sink, with a brick bench, 2 feet 6 inches by 2 feet, at one end; and also the brickwork for a copper and furnace, the inside of which is to be lined with fire bricks. All the flues of the respective fireplaces to be built circular, 12 inches in diameter, when the pargeting is laid, except those of the kitchens, which are to be 14 inches in diameter. Two circular flues to be formed in the haunches of the arches, with openings where directed, for the conveyance of hot air from the stoves to the conservatories and other parts. To set all the grates, ranges, and stoves, required for the several fireplaces, using fire-brick facings; to dig out, and form a cold-air duct to supply the stoves as required. To build arches, &c., for the outside steps; also area walls to the windows, and ½-brick trimming arches to the fireplaces of the chamber and attic story. To build the columns of the conservatories with the required reveals, &c., as per plan; and those of the portico with circular bricks; both laid in cement.

1804. *Carpenter and Joiner.* All the timber used for the carpenter's work to be of the best description of Memel or Riga fir (except where otherwise directed), perfectly well seasoned, and free from dead knots, shakes, or other defects. The roof to be framed as per plan and sections, the king-posts to be of oak, well screwed up with inch bolts and screws; the wall-plating and bond to be dovetailed and halved at their angles, and properly scarfed at their joinings. A tier of bond to be laid immediately under the chamber floor throughout all the walls; and lintels to be laid over the openings of the doors and windows, of the width of the internal walls, and within half a brick of the outside on the external wall. A proper quantity of old oak wooden bricks to be laid in the jambs of the openings, for the doors and windows. The ground floor joists to be of oak on oak sleepers, and the floors above to be framed (as directed) with two girders in each room, notched down on oak templates, 2 feet 6 inches by 4½ inches by 3 inches, with bridging joists, and ceiling beams and joists. The floors to be trimmed at the fireplaces; and each trimming joist to be 9 inches by 3 inches. To provide and fix all the necessary centres for the window, door, and chimney arches, and for the arches supporting the ground floor; which is to be of 1¼-inch split battens laid close, and constructed on strong framed ribs, not more than 2½ feet apart, forming the required groins for the doors, windows, &c. The guttering to be laid with inch boarding on 3½-inch by 3-inch bearers, and the boards to lie 9 inches up the roof; the valley boards to be ¾-inch deal, 9 inches wide on each face. No floor or ceiling joists, or studs to the partitions, to be more than 12 inches apart. The scantlings of the principal timbers to be as shown and figured on section. The conservatories and part under the portico to be covered with inch boarding, on 3-inch by 4-inch deal bearers (for lead).

1805. *Joiner.* All the deals used in the joiner's work to be the best Petersburg or Christiania deals, free from sap and other defects, and well seasoned; and if any of the work executed by the joiner shall, within the space of six months from its completion, shrink or fly, to the extent of one eighth of an inch, or in any other respect fail, the contractor shall, when required by the Architect, make good the same: he is to provide and fix the ironmongery, and all other ironwork mentioned, but not provided for, in the smith's work.—Basement Floor. The doors to the two cellars, shoe-place, pantry, and china-closet to be 1¼-inch proper ledged doors, hung with 12-inch cross garnet hinges, to 3-inch by 4-inch oak door frames, and on each is to be fixed a 9-inch stock lock, and a Norfolk thumb latch. The two kitchen doors to be 1½-inch thick, 4 panels and squares, hung with 3-inch cast butt hinges, to 1½-inch rebated and rounded jambs; on each is to be a 7-inch iron and rimmed lock. The outward door (into area) to be 2-inch 6-panel bead flush and square; hung with 4-inch butts to 4-inch by 2½-inch rabbeted frame, and a beaded casing 4 inches by half an inch, and fixed round the jambs and soffit to the outside. On it fix a 10-inch best iron-rimmed lock, and two 10-inch barrel bolts. The water-closet door to be 1¼-inch, 4-paneled and square, hung with 3-inch butts to a 3-inch by 1-inch door-frame; and on it fix a 4-inch spring latch. The door to the coal-place to be 1¼-inch proper ledged; hung with hooks and riders (bands), fixed in the wall; with a 10-inch stock lock and Norfolk latch. The ash-pit door to be inch-ledged, hung in the same way, and with a thumb latch. The windows to the best kitchen to be 1½-inch ovolo sashes, single hung, with deal-cased frames and oak sills; and 1¼-inch framed bead butt shutters, to be made to fold (in two flaps, with a rule joint) against the wall, with a small inch boxing, or architrave, made to receive them; also inch rounded window boards.

On each fix proper sash fasteners, and find lines, weights, and pulleys to the sashes. The back kitchen window frame to be a three-light transom, the sill of oak, with 1½-inch York sashes, the centre made to slide; and in each to fix a sufficient number of iron stanchions. Round the inside fix ¾-inch linings, with mouldings round, and inch window board. The windows to the pantry, china-closet, and shoe-place to be in two lights made to slide, and in every other respect as the last; there is also to be a small one-light in the water-closet. Round the best kitchen is to be fixed a 7-inch torus plinth, plugged to the wall; and a 5½-inch by 1-inch do. round the back kitchen pantry, closet, and passage, and also up the (stone) steps leading to the hall. Three tiers of inch shelving, with proper bearers, to be fixed on each side of the pantry and china-closet; and in the arch of the pantry to fix a meat rail, with meat and game hooks. The water-closet to be fitted up with inch oak, wrought, framed, and clamped seat board on deal bearers; the flap to be of the same description, hung with 2½-inch butts; round the seat is to be a 5-inch by ½-inch oak skirting; and round the floor is to be a 5½-inch by 1-inch deal do. To fix ¾-inch casings to the pipes where required. — Ground Floor. The front or entrance door to be 2¼-inch double margined, in four panels (as drawing, to be given), with mouldings laid on outside, and reeded and flush inside; hung with one pair and a half 4-inch butts, to 5-inch by 3-inch jambs. Round the jambs and soffit outside fix 3½-inch by ½-inch beaded casing (behind which the stucco will finish). A moulded and rabbeted transom rail to be framed in the jambs; and over the door provide and fix a metal fanlight. A 12-inch best iron-rimmed drawback lock, with brass furniture, to be fixed on this door; also two 12-inch brass barrel bolts, and an iron door-chain. The doors to the two sitting-rooms to be of 1¾-inch stuff, in four panels, double margined, and moulded on both sides; to be hung to 1½-inch rabbeted linings, with 4-inch brass rising butts. On each is to be fixed a mortise-lock, with ebony furniture, the prime cost of which is to be 15*s.* each. The door to the basement to be 1½-inch deal, in four panels, moulded and square, hung with 3½-inch butts, to 5-inch by 1½-inch rabbeted jambs; and to have a 9-inch iron-rimmed lock fixed on it. The doors from the hall to the conservatories to be 2¼-inch sash-doors, with diminished styles, hung to 5-inch by 1½-inch jambs, with one pair and a half 3-inch butts, having a best mortise lock, with ebony furniture on each: 1¼-inch shutters to be provided for these doors, with proper fastenings and bars (the whole more fully described by the working drawings); the two doors leading out of the rooms into the conservatories to be of the same description, with shutters, &c. (which will also be described more fully by drawings at large). The doors to the hall and sitting-rooms to have 5½-inch by 1¼-inch architraves round, with frieze and cornice. The windows to the sitting-rooms to have 2-inch sashes and cased frames, with oak sills and pulley pieces; the sashes to be double hung with 1¾-inch best brass axle pulleys, having patent sash fasteners, lines, weights, &c. Each window to have boxing shutters, framed with 1½-inch moulded front flap, the other 1¼-inch square; to make also proper boxings, with inch back lining and grounds, and a 5½-inch moulded architrave round. Also a 1¼-inch framed and moulded dado to correspond with the shutters, backs, elbows, and soffits. On each set of shutters to fix two 18-inch shutter bars, and two brass shutter latches, with ebony furniture. The sashes to the conservatories to be of 2-inch double hung, with frames, &c., as last described. The finishings, &c., shown by the working drawings. The floors of the sitting-rooms to be laid with inch red deal, in narrow boards, and edge-nailed. Proper margins to be laid round the hearth-stones: 2½-inch by ¾-inch grounds to be fixed round these rooms, as well as the hall and staircase; and upon them is to be a 10-inch double-moulded plinth, with backings and furrings. — Chamber Floor. The doors in this story to be of 1½-inch deal, moulded and square, hung with 3-inch butts to 1½-inch linings. Round the door in the landing is to be a 5½-inch moulded architrave, and on the inner side of rooms a single moulding; and on each is to be fixed a mortise-lock, with ebony furniture; except the closets, which are to have 7-inch iron-rimmed locks. The windows to have 1¾-inch sashes, double hung, with case frames, oak sills, and pulley pieces, with lines, weights, &c., complete, as before described on the ground floor. A ¾-inch lining, with single mould, and inch window-board to be fixed to each window. The floors to be of inch deal narrow boards, laid folding, with proper margins. The grounds to be fixed as chamber floors where required; and a 7-inch by 1-inch ditto moulded plinth to be fixed round each room and closets. The plinth round the landing to be the same as that on the ground floor. The water-closet to be fitted up with inch clamped Spanish mahogany seat, on deal 3½-inch by 3-inch bearers and standards; the flap to be of the same description, beaded and clamped; and on one side there is to be a 12-inch by 6-inch paper-box, to be framed with coves. The riser to be ¾-inch mahogany, framed and beaded in one panel; round the closet is to be a 6-inch by ½-inch mahogany moulded skirting. To fix proper linings and casings to the pipes. To frame a cistern over the closet, out of 1½-inch dovetailed. Angle beads to be fixed to

all angles.—Attic Floor. The doors to be of 1¼-inch deal, four-panel and square; hung with 2½-inch butts to 1¼-inch rabbeted linings, and rounded, and a spring latch with a bolt to each. The windows to have 1½-inch moulded sashes and frames as before, single hung, &c., complete; to have ¾-inch linings, with inch window-board and mouldings round. A 5½-inch by 1-inch torus plinth, plugged, to be fixed round each room, landing, &c., on this story. The floors to be of inch deal, laid folding as below. — The staircase is to be built on three deal carriages, geometrically hung on three bearers, and fastened at the bottom to an oak sill. The carriages to be 4 inches by 2½ inches, laid flatwise; and the bearers and sills to be of old oak, 6 inches by 4 inches. The treads to be of 1¼-inch deal, the riser of inch deal, and boxed to string, with moulded and returned nosings and cut brackets. The strings to be moulded to correspond with the skirting in the hall, in the ground plan. The bottom step to be curtail (the bottom step to be longer than the others, and made to curl round in the same manner and form, and to the same extent, as the scroll of the handrail). The handrail to be of the best Spanish mahogany, 2½ inches by 2¼ inches, moulded and sunk, and French polished, with proper ramps, scrolls, twists, &c., to sweep of stairs. The fascia round the landing, and string to the stairs, to be of inch deal, double sunk and beaded to receive the plaster ceiling. The balusters to be of inch deal, and in every third step a wrought-iron one to be fixed; and on the curtail step is to be fixed a turned iron newel. To provide the necessary screws for the rail. The upper staircase to be of inch deal treads and risers on two carriages, with bearers and brackets. Rail skirting, &c., as before.

1806. *Slater and Plasterer.* To cover the whole of the building with the best imperial slates, nailed in two places with copper nails, on 2-inch by ¾-inch deal sawn laths; the whole to be well torched. The walls and arches of the two kitchens, the passage, the china-closet, the water-closet, to be rendered and set: those of the hall staircase, and landing above, and the two rooms on the ground floor, to be finished, troweled with stucco (three coats). Those of the chamber and water-closet to have three coats of bastard stucco, as well as all partitions. The walls of the attic story to be rendered and set; the ceilings to the ground floor to be L. P. F. (lath, plaster, and float), and set white; also the chamber story. Those of the attic story to be two coats on reeds, and three times white. The contractor to include the sum of £ 30 in his estimate for inside plaster cornices and flowers. — The outside to be stuccoed with quicklime and river sand, in the proportion as directed, except the cornices, frieze, columns, and all other projections, which are to be in cement, as particularly shown by drawings at large, &c. The chamber floors and partition to the water-closet to be well pugged (pugging is a composition of sand and plaster, or common mortar, laid between the joists or studs, to prevent the transmission of sounds, or dust rising from the joints of the floor).

1807. *Stone-Mason.* To provide and fix Mansfield stone front steps, and all other stonework connected therewith, as particularly shown by drawings at large; as well as a Mansfield stone terrace, 3 inches thick. Fix stone curbs to the area gratings of the windows, 6 inches by 4 inches and a half, well cramped and leaded together. Also a stone, 2 feet square, over the rain-water cistern, as well as one to an opening to the coal-place. A stone sink with plug-hole, 4 feet by 2 feet 4 inches. To cover the water-closet of the basement with stone as terrace. To provide and fix Attleborough stone sills to all the windows, 10 inches by 6 inches and a half, properly weathered and throated: to provide a proper Mansfield stone for the pump. To lay the hall floor with rubbed Hopton stone in diagonal quarries. To lay Hopton stone hearths, and Yorkshire back hearths to the two sitting-rooms, 4 feet by 1 foot 10 inches; to lay rubbed York stone hearths (and back hearths) in each fireplace of the bed-rooms, 3 feet 8 inches by 1 foot 8 inches. The staircase to the basement story from the hall, as well as the steps into the area, and from the terrace into the garden, to be of solid Mansfield stone; to provide and fix stone architrave over the columns and through the walls (as shown by the plans).

1808. *Plumber and Glazier.* To lay all the lead gutters with 7-pound cast sheet-lead, with 2-inch drips, to extend, in all places, 9 inches up the roof and 4 inches up the wall; with a lead flashing of 5 pounds to the foot, at least 5 inches deep. All the hips, valleys, and ridges to be laid with 5-pound lead; the top of the conservatories, and under the portico, with 6-pound lead. To line the cistern of the water-closet with 7-pound lead. To fix a pump with 3½-inch brass forcing apparatus, with every thing necessary for the same, oak standards, stage, stays, cheeks, &c., complete; and 2½-inch suction pipe, stop, bib, cock, and 2-inch best screw bottom. To branch a 2-inch rising main into the cistern of the water-closet; also a branch of 1½-inch pipe from this main, with best brass cocks, &c., for the copper in the back kitchen. To put a half-inch warning-pipe from the cistern to a convenient place near the pump; and another 1½-inch pipe, with brass cock, &c., to be laid into the conservatory, where directed. To provide and fix in the back kitchen a lead rain-water pump, with 2-inch suction

pipe, and 9½-inch cylinder, with oak standard plank, wrought-iron lift, and cheeks, complete. To provide and fix a set of Hardcastle's best water-closet apparatus, with service cistern and pipe, cranks, wires, &c., complete; and a 4-inch soil pipe to the culvert; also a self-acting water-closet in the area below, with lead service pipe, wires, cranks, and soil pipe, as for the other water-closet. The conservatories, and the whole of the windows, to be glazed with the best crown glass, except those of the basement floor, which are to be of the best seconds. The whole of the work usually painted to be done three times over in oil, and the outside to have four coats in oil.

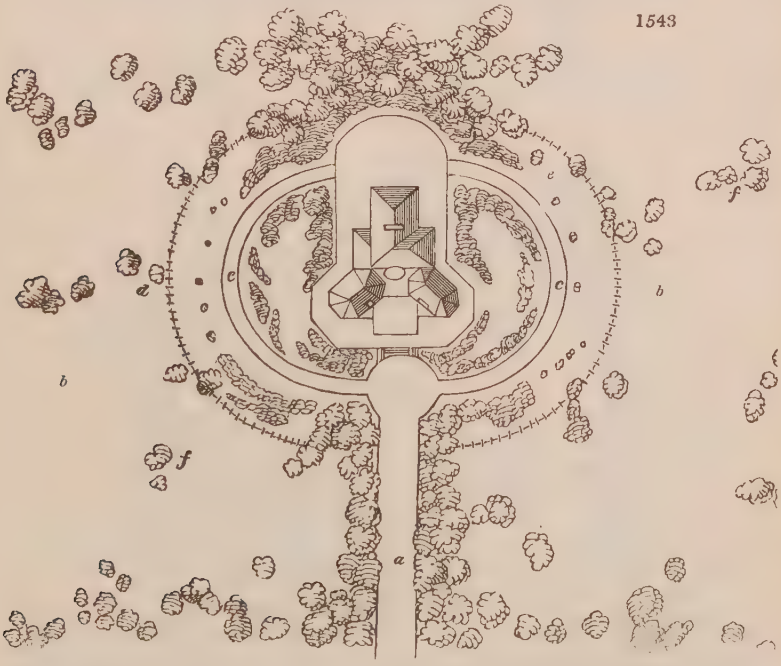
1809. *Remarks.* Considering this as a suburban dwelling, where the great object is concentration, we think its Architects have been successful in adopting an economical form; and in making the most of the different floors. The arrangement of the basement story is very satisfactory, and the idea of adding to the width of the open area by vaulting, open in front, is worthy of imitation in other places. This might even have been carried farther, and a wash-house and cleaning-place might have been obtained in this manner at *b b*. The flue from the boiler might easily be carried across the area over an arch or buttress. The operation of washing ought never to be performed in the basement story of a house, if it can possibly be avoided, on account of the soapy steam which must inevitably ascend into the living-rooms. When washing must be carried on in the basement story, a hood should be formed at a convenient height above the boiler, and from it there should be a funnel connected with an air-flue, built so close to the flue of the furnace, as that the warmth of the latter might create a draught in the former. Air-flues for ventilation should indeed always be formed in kitchens, sculleries, and wash-houses. The party wall between the two dwellings appears to be only nine inches thick, which seems to us to be dangerous, with reference to the chance of fire happening to break out in either house. About London, the party wall of such a building is required by law to be not less than eighteen inches in thickness; but even that is too little, where this wall, as in the case before us, contains all the flues. The flues in this Design are carried up in thick projections, as indicated by the jambs of the fireplaces in fig. 1542. There are, however, no lath and plaster partitions, the absence of which is a great impediment to the spread of fire, when it has once broken out. Whoever lives in a house, the interior of which is subdivided by lath and plaster partitions, and which has hollow boarded floors, with a wooden staircase, is scarcely safer that if he dwelt over a mine of gunpowder; as, if any part of such a house should be accidentally ignited, it would be hardly possible to stop the rapid spread of the flames. The plan of arching over the whole of the basement story with brickwork, § 1803, is excellent, in point of strength, safety from fire, and for deadening the sounds proceeding from below. Indeed, we are persuaded that the time must shortly arrive when all houses will either have arched floors of this kind, or floors of some other description of masonry, to prevent the spread of fire either upwards or downwards from any apartment where it may break out. By means of iron girders, flat arches may be formed over wide apartments; and, for small rooms of every kind, we see no objection whatever to semicircular arches, which, as they have no lateral thrust, would require no extra thickness in the walls. A great object in point of external effect would be gained by highly arched ceilings; because the character of strength would be heightened by the increased depth of space between the tops of the windows on one floor, and the sills of those over them. This is one grand cause of the expression of strength in ancient castles, and in the buildings of Florence and other cities of Tuscany. Great care is requisite in heating so small a house by hot air; which, even when managed in the best manner, is, in a confined space, apt to come in currents, and the effect of a current, whether of hot or cold air, is much more powerful in suddenly raising or lowering the temperature than a greater degree of heat or cold without motion in the air. In consequence of this, we have observed that persons who live in houses heated by hot-air stoves are particularly liable to catch cold, even without going out of the house. We are quite satisfied on this point by our own experience, having had our own house heated several years since in the most scientific manner by the late Mr. Sylvester, and having been obliged, from the cause mentioned, to give it up, and adopt hot water. Mr. Sylvester's plan is by no means liable to the same objection, in the case of heating very large houses. The great extent of steps on each side of the entrance front seems out of proportion to the entrance itself; but these steps must be looked upon as a contrivance to conceal the area, and more as a stage for plants in pots, than as a flight of steps. In point of taste, we should have preferred enclosing the two green-houses, or plant cabinets, with piers and flat arches, to employing either round or square columns; but still we acknowledge that the round Doric columns, shown in the Design, admit more light, both to the plants and to the glass door which connects the green-house with the room. It will be observed by the plan, fig. 1541, that the glass case which encloses the plants is totally distinct from the circular columns. This is highly proper, because nothing is more inconsistent with the principles of strength and fitness, than to

see round columns joined either to panels of glass or wood, or to flat walls. Had piers and arches, or square columns been employed, of course the glazed panels would have been joined to them, which would have been equally proper; because the junction is equally consistent with strength, and more so with fitness, than if the glass case had been an independent structure; for its junction with the right-angled supports offers a sufficient reason for their being so. Whether round or square columns were employed in front of the conservatory, we should in either case have omitted altogether the projection above, supported by four Corinthian columns, which gives the edifice the expression of a public building, and which we consider as quite uncalled for in a private house, even if the whole of this double villa were but one dwelling. We are quite aware that the introduction of columns and projections in this manner is justified by the practice of many who bear great names among modern Architects; but we have no more doubt of its being essentially in bad taste, than we should have of the bad taste of a labourer, who arrayed himself in his holiday clothes to do his every-day work. In short, this projection is a mere excrescence; a kind of mimicry of a part of Roman Architecture rather than an adaptation of it; and, in point of fitness, it is rather injurious than useful, because it shades the windows under it. Were it entirely removed, and a part of the roof, and the chimney-stacks shown, the effect of the edifice would be highly respectable as a dwelling-house; as it is, the expression is something between that of a dwelling-house and that of a public building.

Design XIII.—*A small Grecian Villa or Casino, to be placed on an Eminence, commanding extensive Prospects in two Directions only.*

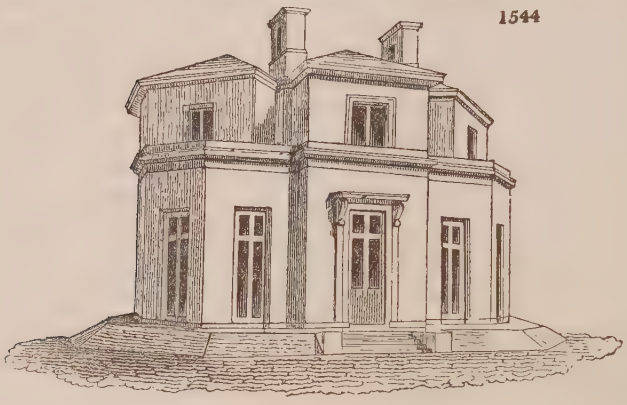
1810. *The Situation* is supposed to be elevated, and the approach to be a straight avenue, bordered by an irregular phalanx of evergreen trees and shrubs, so as to be impenetrable to the eye on both sides, as shown in the general plan, fig. 1543, in which

1543



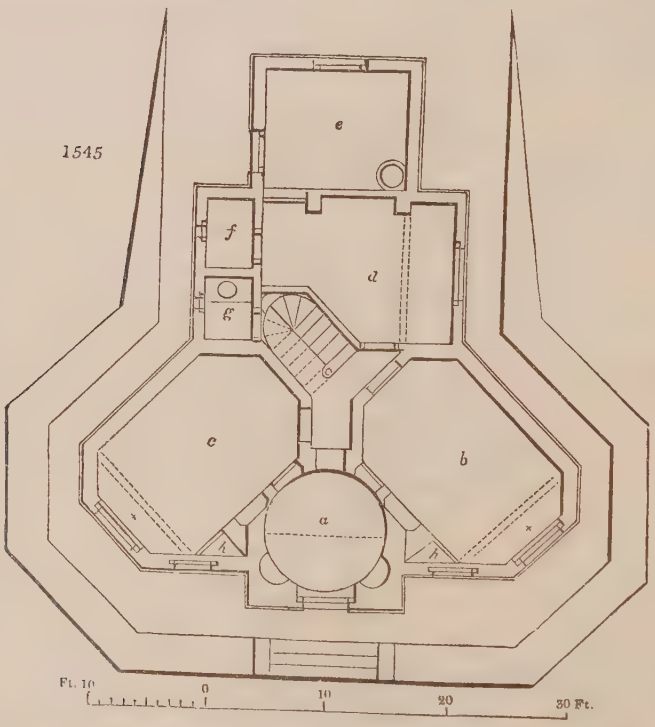
a is the avenue, and *b b* the direction of the two principal views; *c*, walks round to the kitchen court and back entrance; *d*, a wire fence enclosing the lawn; *e*, groups of low shrubs and flowers; and *f*, scattered groups of trees. On approaching the house, the view within 300 yards will be as in fig. 1544, and the stranger will enter without any expectation of enjoying a prospect from the rooms; but whether he is ushered into the dining-room or drawingroom, he will be agreeably surprised to find that he has been mistaken.

1544



1811. *Accommodation.* The plan of the principal floor, fig. 1545, shows a vestibule, *a*, circular in the plan, ten feet in diameter, and with a domed ceiling; the dining-room,

1545



b; drawingroom, *c*, eighteen feet by twelve feet, and ten feet and a half high; a kitchen, *d*; scullery, *e*; pantry, *f*; water-closet, *g*; and closets to the dining-room and drawingroom, *h h*. The bed-room floor contains three good bed-rooms, a smaller bed-room, and two bed-rooms for servants. The space marked ×, in the dining-room and drawingroom, is roofed flat, and covered with lead, so as to form balconies to two of the bed-rooms.

1812. *General Estimate.* Cubic contents, 24,560 feet; which, at 6*d.*, is £614.

1813. *Remarks.* This is an elegant Design, well adapted for a particular situation;

and for the occupation of a family of not more than two or three persons, with two servants, but without children. The author of this Design, and also of the Italian parsonage Design IX., is William Bardwell Esq., a London Architect, who has distinguished himself by erecting cottages for the poor, on his own estate at Blackheath, and letting them at moderate rents; by a magnificent plan for the improvement of Westminster; and by various other benevolent and patriotic schemes.

Design XIV.—*A Villa in the Old Scotch Style, erected, in* 1831, *at Springfield, near Glasgow.*

1814. *The Situation* of this house is three miles north of Glasgow, on a hilly and somewhat irregular surface. The offices at Springfield are at a short distance from the house, owing to some local peculiarities; but in this Design they are placed near to it; as being more convenient, supposing the whole to be executed in a locality where nothing prevented the adoption of this arrangement. The general appearance, on

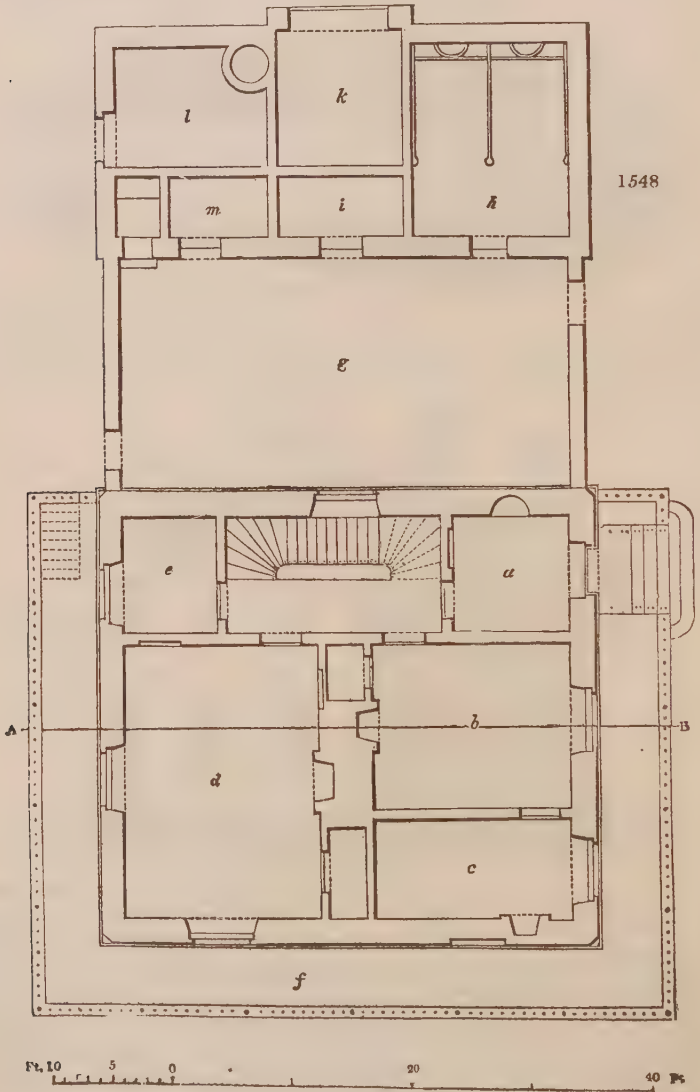
1546

approaching the entrance front, is as shown in fig. 1546, and a nearer view of the same front is given in fig. 1547. The principal views are towards Ben Lomond, the Vale of Clyde, and the Campsie Fells. Every one who has seen the house of a Scotch laird,

1547

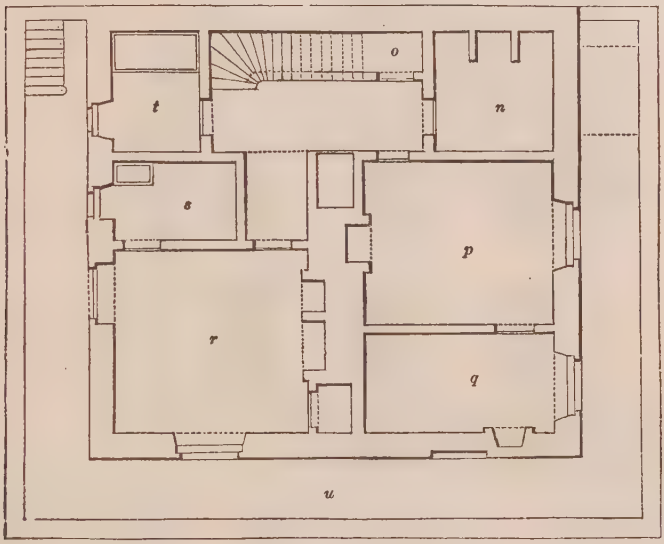
erected during the seventeenth century, will allow that this is a very good imitation of the old Scotch manner, which, like the laird himself, was dignified but severe, and forbidding rather than inviting. There is something too commonplace and town-like in the iron rails and sunk area; and, though porches were unknown to the old Scotch villa, yet the Architect would have been perfectly justified in adding one to this Design; provided, in doing so, he adhered to the generalstyle, and manner of the building. It must always be recollected, that, in imitating any style we are not limited to copying particular forms; but are required to enter into the spirit of the subject or style to which they belong, and to form a new composition in that spirit, adapted to whatever use it may be required for. When we hear, therefore, of Architects stating that there is no precedent

for such and such things in the models which they take for imitation, we consider that it shows a want of comprehensive views, and indicates that man is a slave of his profession, rather than the master of it. It is, however, proper to observe that the object of the Architect may be, to produce such an imitation as may actually be mistaken for the thing imitated. For example, Mr. Cleland may wish his villa to be taken for a real old Scotch house; in which case nothing that is not generally found in such houses should be introduced. This, however, is a low style of art, and is to original composition in Architecture what portrait painting is to historical painting; drawing from an individual instead of from the species. Any builder may copy a style, but it requires an Architect to compose in it. One reason why churches afford so little pleasure as architectural compositions, in proportion to their great cost, is, that they are, for the most part, fac similes of one another; or, at any rate, that they are more so than any other class of buildings, public or private, whatsoever.



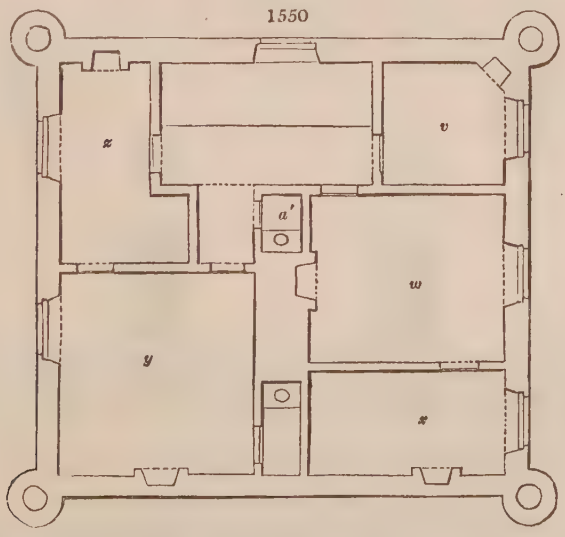
1815. *Accommodation.* The principal floor, fig. 1548, contains a vestibule, *a*, opening to a hall and staircase; a parlour, *b*; store-room, or study, *c*; dining-room, *d*; butler's pantry, *e*; and sunk area, *f*. There is a back court, *g*; two-stalled stable, *h*; place for fuel, *i*; chaise-house, *k*; wash-house, *l*; and dung-pit, *m*. The basement floor, fig. 1549,

1549



contains a wine-cellar, *n*; beer-cellar, *o*; laundry, *p*; servants' room, *q*; kitchen, *r*; scullery, *s*; bath-room, *t*; and sunk area, *u*. The upper floor, fig. 1550, contains a

1550



small bed-chamber with a fireplace, *v*; drawingroom, *w*; bed-chamber, *x*; principal bed-chamber, *y*, in which there is a water-closet; children's bed-room, or dressing-room, *z*; and another water-closet, *a'*.

1818. *Construction.* Fig. 1551 is the elevation of the entrance front, and fig. 1552 that of one end. The walls are of stone. The roofs are supported by corbel-stones.

1551

shown in fig. 1553 : the roofs have no gutters at the eaves, but there are lead gutters along the roofs, a little way above the eaves, which collect most of the water, and

1552

carry it across the garrets to a central gutter, from which it descends by pipes at each end, after supplying a cistern above the level of the two upper water-closets. In houses of this kind the rooms on the basement are invariably arched over with masonry, which is not only an efficient defence against the spread of fire, but, in feudal times, must have added to the security of the family living in the floors above. In houses so constructed

there will invariably be found a large blank space in the external walls between the small windows of the offices in the basement story, and the larger lofty windows of the living-rooms over it.

1553

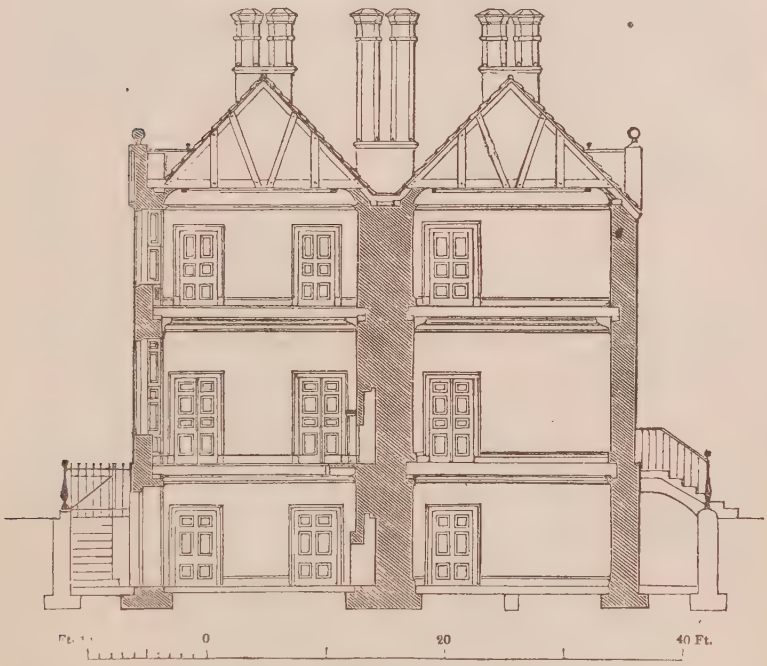


Fig. 1554 shows the stone cornice under the eaves of the roof, to a scale of two inches and three quarters to a foot.

Fig. 1555 shows the moulding to the tops of the chimney shafts.

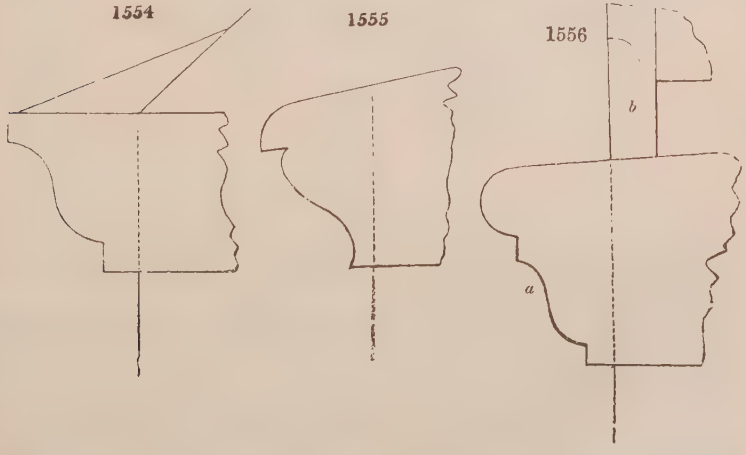


Fig. 1556 shows the moulding to the sills of the windows, *a*; and that round the windows, *b*.

Fig. 1557 shows the section of the architraves of the doors and windows of the two principal floors.

Fig. 1558 shows the mouldings round the panels of the principal doors.

Fig. 1559 shows the moulding on the ceiling of the drawingroom cornice.

Fig. 1560 shows the skirting of the parlour.

Fig. 1561 shows the skirting of the dining-room.

Fig. 1562 shows the moulding on the wall under the coving of the drawingroom cornice.

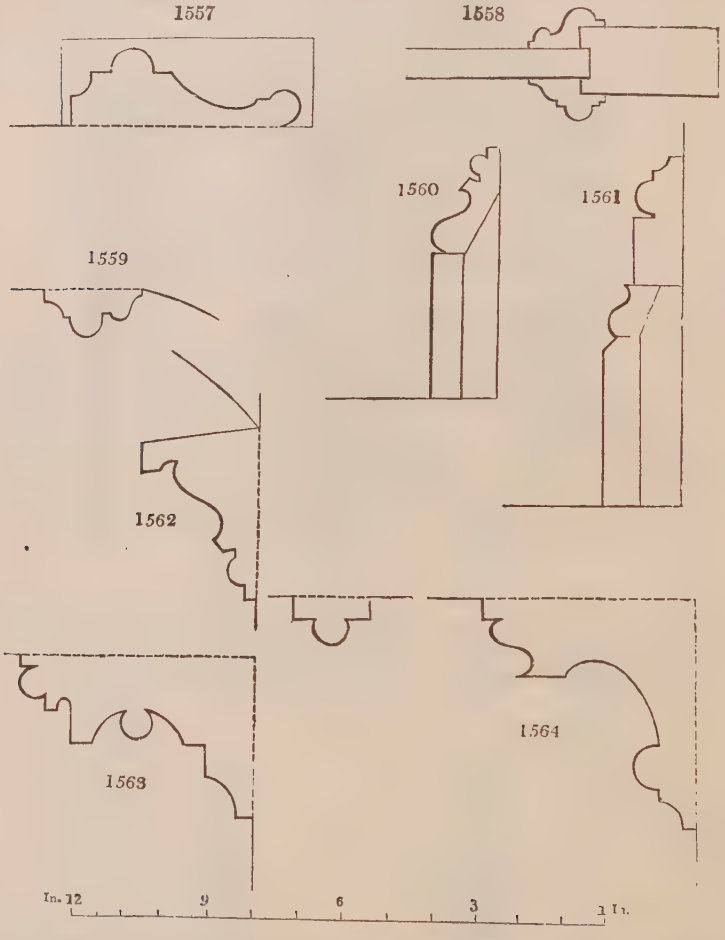


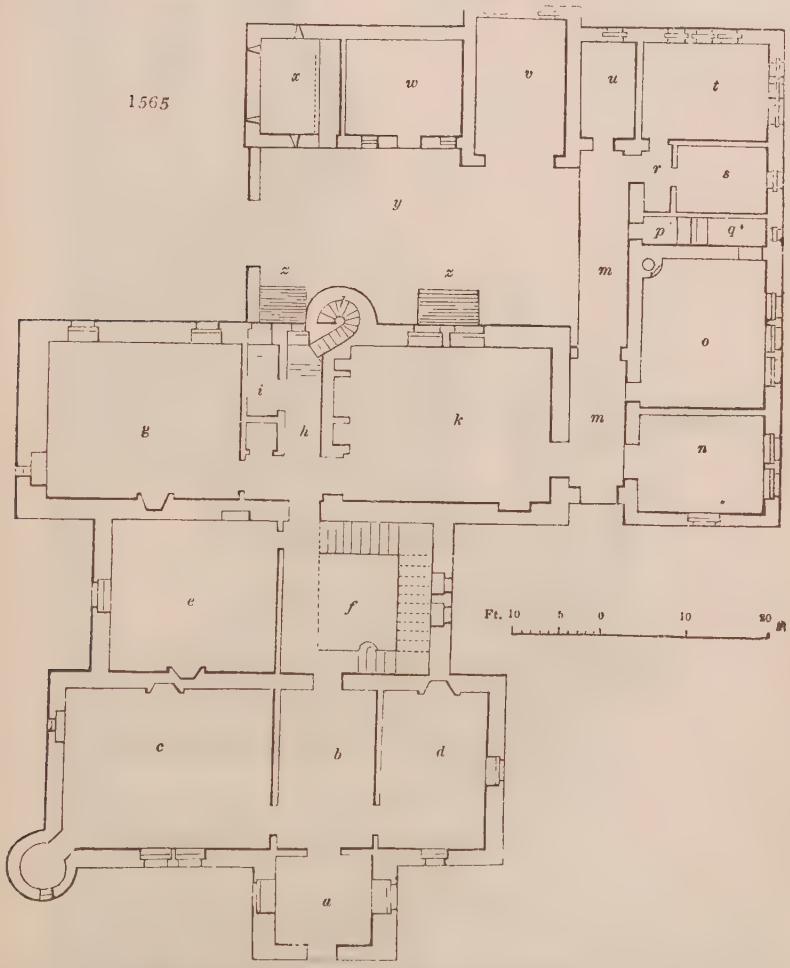
Fig. 1563 shows the dining-room cornice, and fig. 1564 shows the parlour cornice. All these figures are to the same scale of two inches and three quarters to a foot. None of the cornices or mouldings are enriched.

1817. *Estimate.* The following is the actual cost of this building:—Mason's work, £495; carpenter's work, £320; plumber, £60; slater, £30; plasterer, £50; marble for chimney-pieces, &c. £45: in all, £1000. This sum does not include the offices nor the turrets.

1818. *Remarks.* We are indebted for this Design to William Reid, Esq., Architect, Tradestown, Glasgow, by whom it was planned and executed for David Scales Cleland, Esq., in 1831. It is rendered particularly valuable by the sections of the mouldings, and by the other details of construction.

Design XV. — *A Mansion, in the Style of a Scotch Baronial House of the Sixteenth Century, with the Accommodation and Arrangements suitable to a Villa of the Nineteenth Century.*

1819. *Accommodation.* The general appearance of this villa is shown in fig. 1566, and the ground plan in fig. 1565. In the latter are, *a*, outer lobby; *b*, inner lobby; *c*, butler's room; *d*, waiting-room; *e*, housekeeper's room; *f*, great staircase; *g*, servants' hall; *h*, passage; *i*, water-closet; *k*, kitchen; *l*, back stairs to the dining-room; *m*, covered passage; *n*, scullery; *o*, wash-house and laundry; *p*, men-servants' water-closet; *q*, women-servants' ditto; *r*, lobby; *s*, coal house; *t*, dairy; *u*, potato-house; *v*, coach or gig-house; *w*, stable for four horses; *x*, cow-house; *y*, open court; *z*, gratings to the cellars,

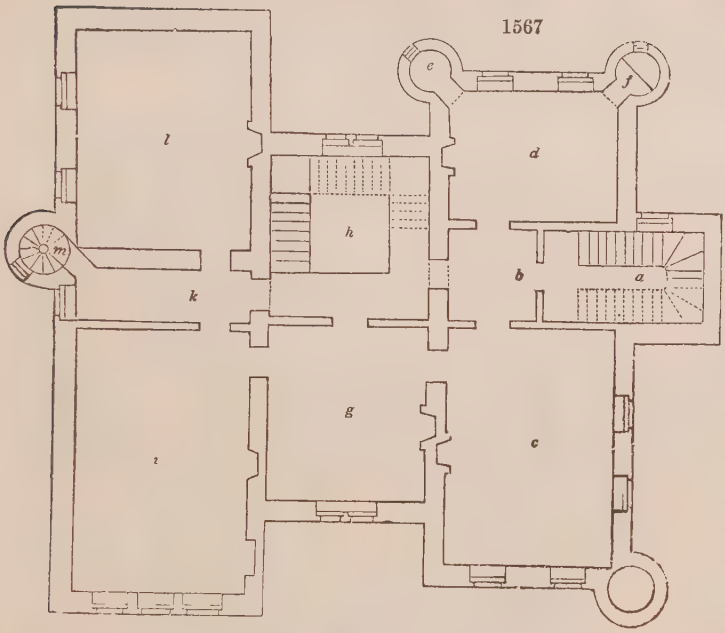


below the back part of the house, for wine, beer, &c. Fig. 1567 shows the plan of the principal floor, which contains, *a*, stairs to the bed-rooms or attics; *b*, lobby; *c*, drawingroom; *d*, boudoir; *e*, closet off the boudoir; *f*, water-closet off ditto; *g*, library; *h*, great staircase; *i*, dining-room; *k*, passage; *l*, parlour, or principal bed-room; *m*, back stairs from the kitchen, and leading up to bed-rooms above.

1820. *Construction.* The walls, in this style, are invariably of stone; the windows and doors of the principal part of the building have hewn facings, and also the chimney tops, the battlements, the cornices, and the crow-steps. The roofs are steep, and covered with grey slate. Fig. 1568 is the south or front elevation; in which, on the left, may

1566

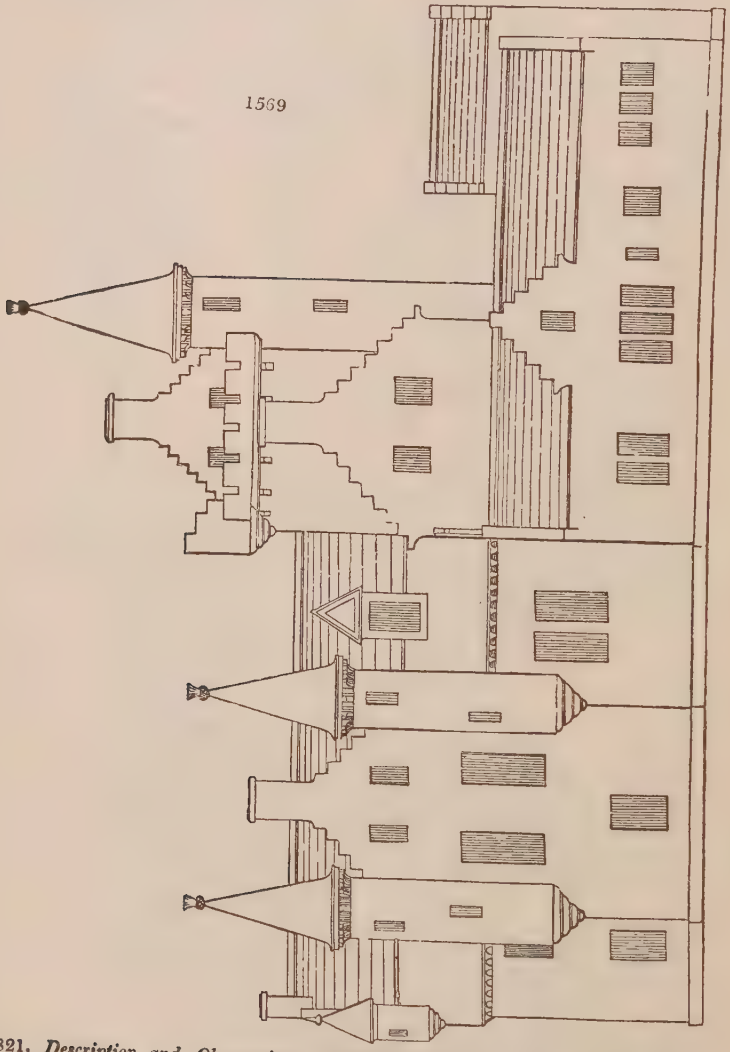
1567



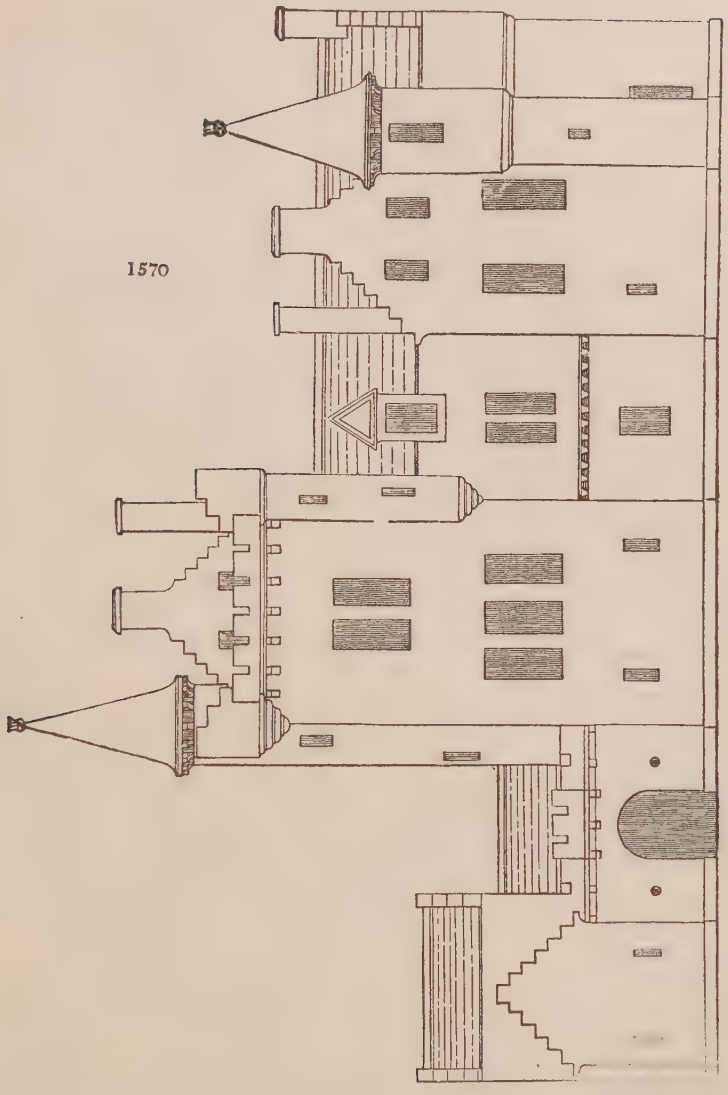
1568

be seen a projection, *n*, serving as a finish to the turret, which formed the bartisan, or watchtower; the watchman walking backwards and forwards between that and the corresponding projection, *o*, at the other end of the line of battlements. Fig. 1569 is the eastern elevation; and fig. 1570 the western elevation.

1569



1821. *Description and Observations.* This Design has been sent us by David Cousin, Esq., Architect, Edinburgh, accompanied by the following observations: — "In this Design, I have endeavoured to adhere closely to examples of the style characterised by turrets, gables, steep roofs, high chimneys, bartisans, &c., which may, with propriety, be called the style of the Scottish Manor House. The examples which I have taken for precedents are the following: — Gogar House, near Edinburgh; the Dean House; Audie Castle, and Tulliebole, in Kinross-shire; Friars' Carse (an engraving of which may be seen in *Picturesque Views of Scotland*, by A. De Cardonnel); Dairsie Castle; Castle Grantully; and Craig Crook; some idea of most of which may be formed from views of them in *Forsyth's Beauties of Scotland*. I am not antiquary enough to hazard any decided opinion as to the proper age to which this peculiar style



of Architecture may be assigned; and, as I have not been able to lay my hands on any work treating on the subject, I speak merely from the opinions which I have formed perhaps hastily enough, from examining some of these interesting remains of antiquity. It appears to me that the existing combinations which we find in many of the best examples, and which I have endeavoured to imitate, have not been the result of one effort, but of several; and that the massive square or circular tower, with its loopholes and battlements, which gives these edifices such a lofty and commanding aspect, was the original part of the fabric, the other parts being subsequent additions, suited to the increased wants and refinement of a later age. The date of the one part, I think, we may, with propriety, assign to the end of the thirteenth or the beginning of the fourteenth century; that of the others (the additions, if we may so call them), to the early part or middle of the sixteenth century. The leading features of these additions are evidently different from those of the original building (which was generally castellated), and were

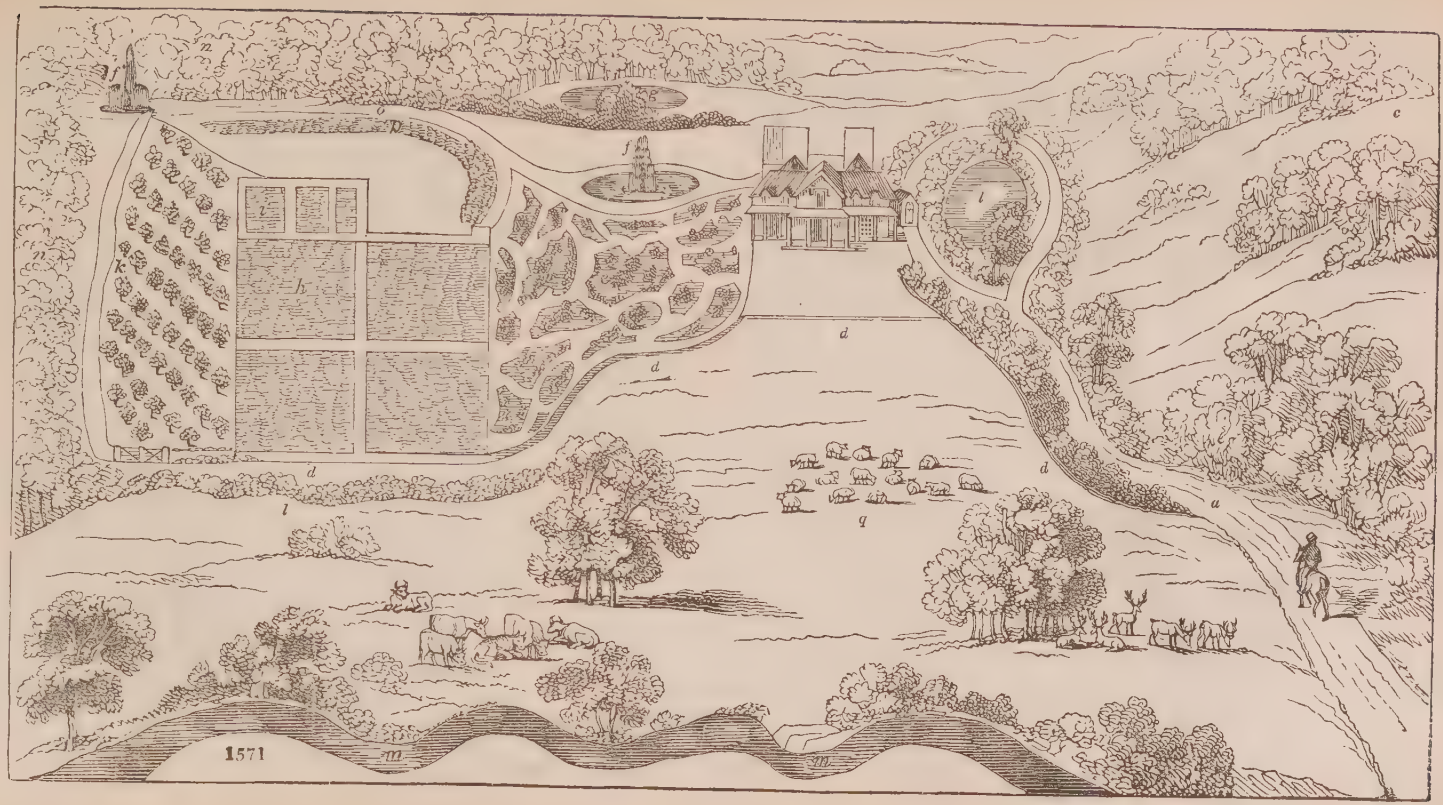
probably introduced into this country from France. This appears the more likely, as we find, in many instances, that the French have had great influence on the manners and customs of the Scots; and whoever has seen any of the French châteaux of the sixteenth century, will at once recognise the striking resemblance which subsists between them and buildings of the same age in Scotland. The wine and beer cellars, &c., I propose should be under the ground floor, and communicate with it, either by a stair from the interior, commencing below the steps of the great staircase, or by an outside stair from the court, placed in the circular tower. The whole of the ground floor of this Design, I propose to appropriate to the servants' apartments; not only because I am borne out, in this manner of arrangement, by almost all the examples of this style of building which I have seen, but because the expression of the elevations requires it should be so; as they do not admit of large windows on the ground floor; small openings being used, as possessing greater security. The walls of the ground floor, in this description of dwelling, were, in general, very thick; and the ceilings were formed of stone arches, of a semicircular form. The great staircase, I propose, should be carried no higher than the level of the first flat (floor); and that the ceiling should be formed on the same level with the other apartments. By this means we get rid of the attic window shown in the elevation, which would come in rather awkwardly. The stairs to the attics are there placed in the space above the entrance lobbies. The interior finishing ought to be plain, rather than otherwise; this style not admitting of groined ceilings, pointed Gothic arches, or other details of finishing peculiar to the Old English Manor House; but rather of that mongrel Grecian sort, which sprang up in the sixteenth century, at the introduction of what has been called the classic style of Architecture."

1822. *Remarks.* This style, whatever may be its origin, is obviously highly characteristic; and, like that of the Old English Manor House, it admits of an unlimited extent of additions, spread out in any, or in every direction. Both are, therefore, essentially progressive styles, and are suitable for an age and country where mankind generally are improving in their manner of living; or where individuals are fluctuating in their fortunes. It cannot be recommended as the most economical style, because it departs too far from the cube, or plain parallelogram; but, in a country where the majority of mansions are in one or other of the economical styles, this may be resorted to as a source of variety, and of original character. As the residence of a Scotsman, in a foreign country, it might raise up many associations connected with his native land; and, though many of these might not be of the most agreeable kind to a liberal and enlightened mind (for the Scots, in the sixteenth century, and long afterwards, were in a state of feudal bondage), yet still, every thing connected with a man's native land, and with the days of his youth, recalls pleasing emotions to his mind. When the Americans have increased in wealth and refinement, and have leisure, not only to build commodious and substantial houses, but edifices displaying architectural style and taste, then it is probable that they will have recourse to the ancient Architecture of the parent country; and to those kinds or varieties of it which prevailed in the particular localities of their ancestors. In this point of view, the collection of published views of ancient British buildings will be of great value to future American Architects; for an American family, in the twentieth century, may order a design for a villa, in the style that prevailed in the particular locality of the parent country, at the time of the emigration of their ancestors.

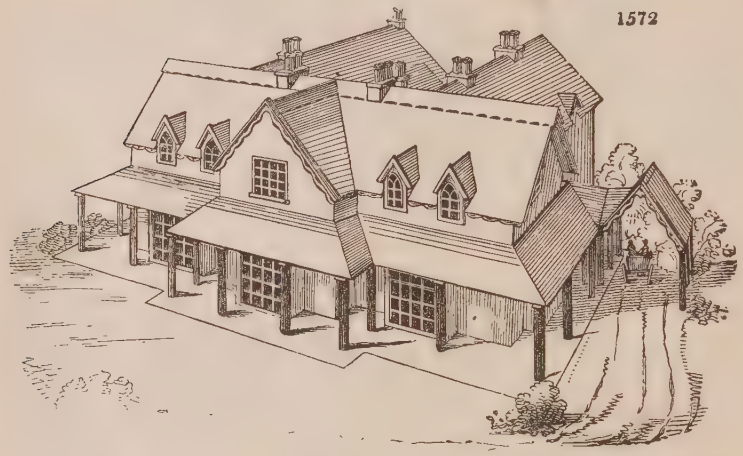
Design XVI. — *A Cottage Villa, built at Chailey in Sussex, for General St. John.*

1823. *The Situation* of this residence is on an eminence facing the south, and commanding extensive views of the South Downs and the adjacent country to the right and left. Some idea of the general arrangement may be obtained from the bird's-eye or isometrical view, fig. 1571; in which *a* is the approach; *b*, a pond in the return circle of the approach; *c*, rising grounds, beautifully wooded in the natural style; *d*, sunk fence, separating the pleasure-ground from the park; *e*, flower-garden; *f*, candelabra fountains, of Austin's artificial stone, supplied from the pond, *g*; *h*, kitchen-garden; *i*, melon-ground; *k*, orchard; *l*, rocky ridge, covered with bushes and trees; *m*, the river Newick; *n*, natural oak woods; *o*, terrace walk; *p*, border for flowering shrubs; and *q*, the park.

1824. *The House* is shown on a larger scale in fig. 1572; and fig. 1573 is the ground plan. In this last figure are shown, *a*, a porch twelve feet wide, and sixteen feet six inches long, under which carriages drive to set down or take up; *b*, an entrance hall, entered by two folding doors; *c*, lobby, entered by a glass door; *d*, principal staircase, lighted from the roof; *e*, back staircase to the servants' sleeping-rooms in the roof; *f*, dining-room, twenty-four feet four inches by eighteen feet four inches; *g*, billiard-room, twenty-three feet four inches by sixteen feet four inches; and *h*, drawingroom, twenty-four feet four inches by eighteen feet four inches. The height of these three rooms is twelve feet. The billiard-room may be separated from the drawingroom by

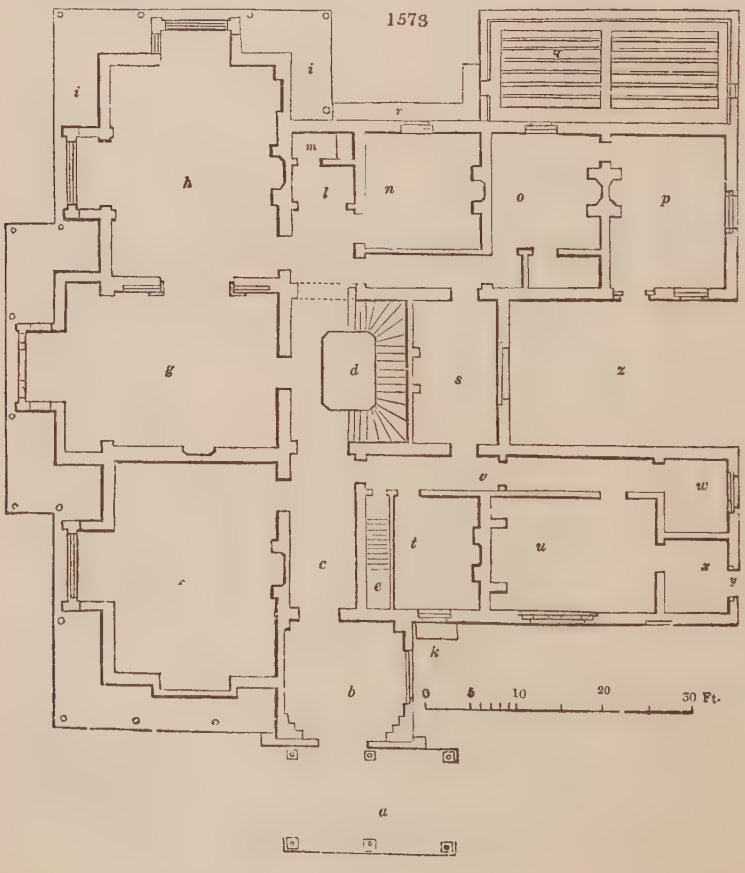

1571

1572



sliding doors; and the bays in all these rooms may be shut out at night by curtains, to retain the heat. The veranda is shown at *i i i i*; *l* is a lobby, having folding glass doors, to the water-closet, *m*; *n* is a business-room, or gentleman's dressing-room; *o*,

1573



a

housekeeper's room, with a large closet, and a door communicating with the laundry, *p*; *q*, conservatory, twenty-seven feet by twelve feet: *r*, paved walk from the conservatory to the veranda; *s*, servants' hall; *t*, butler's pantry; *u*, kitchen; *v*, swing-door to exclude smells; *w*, larder; *x*, scullery, lighted by a sash-door, *y*; *k*, trap-door to cellar; and *z*, kitchencourt. The stable-offices are at some distance.

1825. *Construction.* The walls are built of a compact sandstone, dug from quarries in the neighbourhood. When highly finished, this stone is more expensive than brick; but in common rubblework, for outbuildings, workmen's cottages, &c., it is scarcely more than two thirds of the price of nine-inch brickwork. The roof and the veranda are thatched with reeds; these are more expensive than slates, but they contribute powerfully to give a cottage character to the building; and, where there are rooms in the roof, reeds are found both cooler in summer and warmer in winter, than either slates or tiles.

1826. *Remarks.* What we particularly admire in this Design is, the carriage entrance porch. It is seldom that porches, sufficiently wide for carriages to drive under, are built to any house beneath the character of a mansion; but they contribute so much to the comfort of the occupant and his visiters, that we think every house or cottage which boasts a coach-house or gig-house ought also to have a carriage porch. The necessary width of such a porch will often prevent it from looking well as a lean-to; but we have here an admirable specimen of the manner in which not only width, but length and height, may be obtained, consistently with character and beauty. We are indebted for this Design to the kindness of Joshua Mantell, Esq., of Newick, for whom the sketches were made by James Hurdis, Esq., of the same place, the Architect, we believe, of the cottage. The interior arrangement is good, and the general appearance quite characteristic of a cottage villa. The grounds, as far as we can judge from fig. 1571, want grouping, and connection among the parts; and some of the lines formed by the fences and walks are objectionable. A few single trees, and small groups, however, would go far towards removing this deformity. It must be confessed, however, that it is extremely difficult to judge of what ought, or what ought not, to be done with grounds, without seeing them. In a bird's-eye view, like fig. 1571, a good deal of the pictorial effect is often sacrificed for the sake of giving the information of a map, or general plan. Objects may, also, appear scattered and unconnected in a bird's-eye view, which may yet form connected and harmonious landscapes, when viewed by the eye at the ordinary height of a man walking or riding.

Design XVII. — *A Villa in the Old English Style, the Idea taken from the Ruins of Berwick House, in Wiltshire.*

1827. *The General Appearance* of this villa is shown in fig. 1574, and fig. 1575 is an elevation of the porch. Fig. 1576 is a cross section of the porch, showing the oak door,

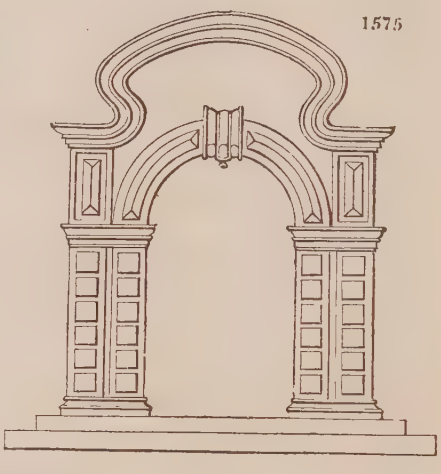
1574

which is four feet wide, and eight feet high. Fig. 1577 is the parapet over the bays, the open work of which is two feet and a half high, with a plinth of ten inches high, a frieze of six inches, and a coved cornice of eight inches Fig. 1578 is a view of the fire-

place of the entrance hall, seen immediately opposite the entrance door. Fig. 1579 is a view of one of the chimney tops.

1828. *Accommodation.* The plan of the principal floor, fig. 1580, shows an entrance porch, *a*; and hall, twenty feet by eighteen feet, and twelve feet high, *b*; dining-room, twenty-one feet by eighteen feet, *c*; drawingroom of the same dimensions, *d*; library, twenty feet by eighteen feet, *e*; principal staircase, *f*; stairs to the kitchen, *g*; servants' hall, *h*; butler's pantry, *i*; housekeeper's room, *k*; with closets for stores, *l*; back stairs up to the bedrooms, *m*; and passage, lighted from the back stairs window, *n*. Fig. 1581 shows the kitchen floor, which extends below the back part of the house only, in which *o* is the kitchen; *p*, the cooking stoves; *q*, the kitchen-range; *r*, the back entrance; *s*, the scullery, containing an open fireplace, oven, and boiler; *t*, the dry larder, with a table in the centre, *u*, for cold meat; *v*, the meat larder; *w*, the coal-cellar; *x*, places for bottles, shoes, lumber, &c.; *y*, stairs up to the principal floor, indicated by *g* in fig. 1580; and *z*, the sunk areas. Fig. 1582 is a plan of the chamber floor, in which *a* and *c* are the two best bed-rooms, with their dressing-rooms, *b* and *d*; *e* is a passage lighted from the back stairs window; *f*, four bedrooms; and *g*, a dressing-room.

1575



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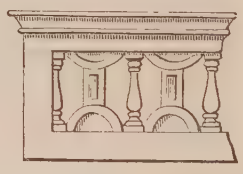
1577



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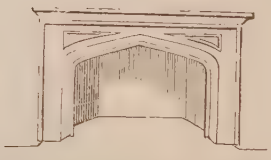

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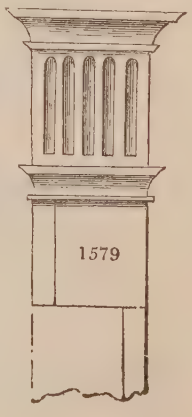
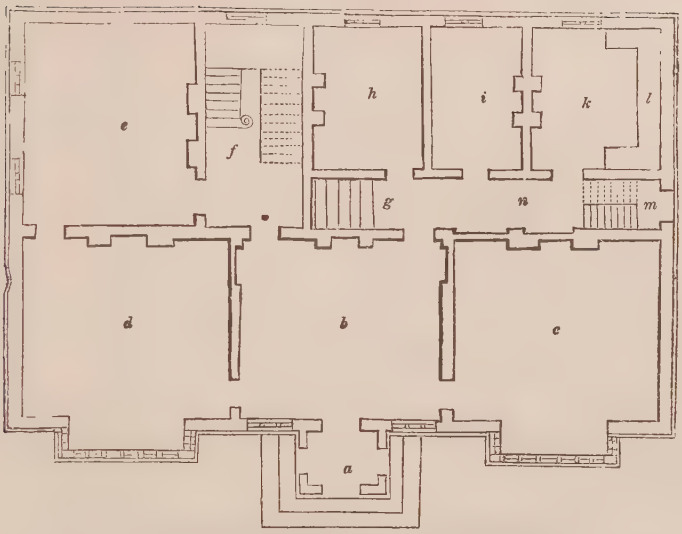


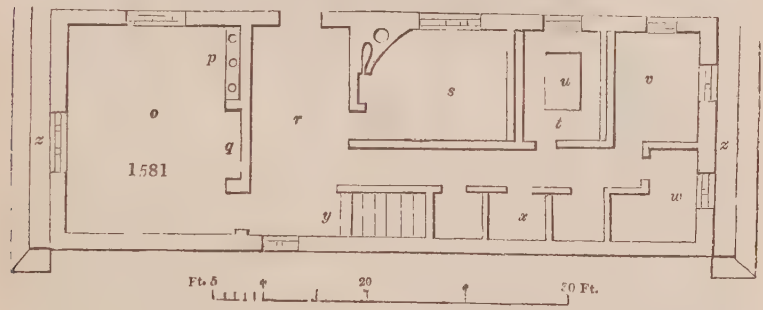
1829. *The Stable Offices* are shown in figs. 1583 and 1584. The former contains two double coach-houses, thirty feet by thirteen feet, *a*; two three-stalled stables, twenty feet by twenty feet, *b*; a two-stalled stable, seventeen feet by thirteen feet, *c*; a lobby, twenty feet by ten feet, *d*, with a staircase to the hay-loft; a harness-room, ten feet by ten feet, with a fireplace, *e*; and two loose boxes for hunters, *f*. In the two principal stables are two trunks for letting down the hay from the lofts, *g*; and corn bins, the lids of which serve as seats, *h*. The trunks are about twenty inches square, and the corn bins eighteen inches wide, two feet deep, and six feet long each. There are two dung-pits, *i i*; and behind is the farm yard, *k*.

1830. *Construction.* All the walling is of freestone, and the roofs are covered with grey slate. The width of the principal

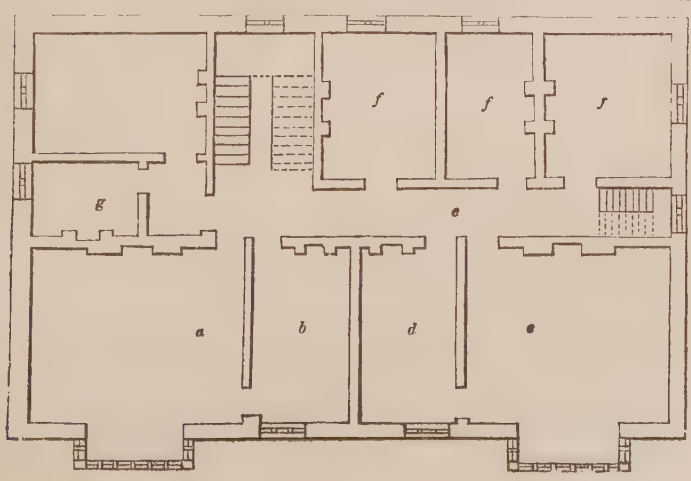
1580



front is about sixty feet; the bays are twelve feet three inches and a half wide, and



project four feet outside measure, and the clear width of the windows is ten feet six



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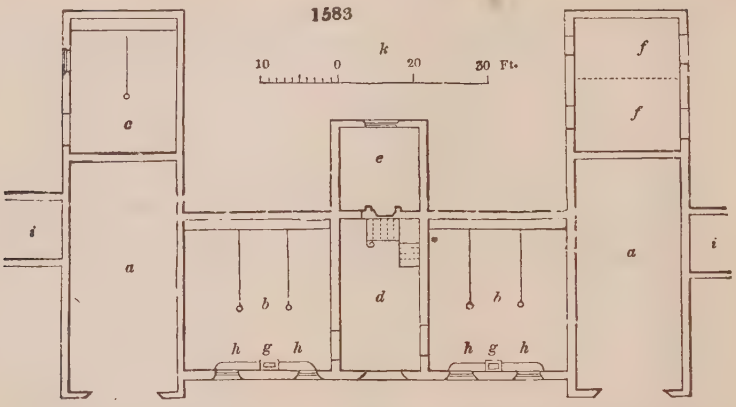
1583



inches; the stanchions, or muntings, are six inches wide; each light is fourteen inches wide, and three feet high. The width of the front of the porch is nine feet eight

1584

inches; the width of the two pillars in front is two feet four inches; the height of the pillars is five feet three inches, and that of the cornice above them seven inches and a half. The height of the front arch, which is semicircular, is nine feet from the floor. The height of the frieze above the imposts on the piers is two feet four inches, and the cornice above is seven inches and a half. These dimensions are given for the benefit of the curious follower of precedents.

1831. *Remarks.* For this Design we are indebted to our invaluable correspondent, Selim, the author of the description of the Beau Idéal of an English Villa, § 1675 to § 1735. He observes of the Design before us, that the front is nearly that of the old house at Berwick St. Leonard, of which there is an engraving after Backler in Hoare's *Modern Wiltshire*. The plan is adapted to this front by our correspondent. He says, "I am not altogether satisfied with the plan that I have composed for the interior. The hall, dining-room, and drawing-room are much as they were in the old house; but I think they are too square, and I do not like the kitchen being below stairs. All the offices appear to have been below in the original; but, in the present state of the ruins, it is impossible to trace the plan of any part except the front, the remainder being converted into a barn and farm offices. The stairs appear to have been in the centre of the house. The house was evidently one of some consequence, though not large. Indeed, the Howes, who, I suppose, built it, were an old family of rank in this county. It stands in a most extraordinary situation for such a house; being let into a bank, and the front is within twenty yards of a dry ditch, which receives the water from several springs in winter. On the back front, the earth is up to the first floor windows. How strange that they did not build it on the top of the bank! It is so let into a hole, that, although not above forty yards from the public road, it can scarcely be discovered by strangers. As such a house would be expensive to build, I have made the plan suited to a person of fortune; but it wants a fourth room, as the gentleman's room for transacting business." The plan, notwithstanding what the author says against it, has, we think, much merit; and the elevation is characteristic. The hall door is a fine specimen of the carpentry of the time of Henry VIII. or Elizabeth. The same kind of

radiating raised panels are found in the cabinets, and other pieces of furniture, of that time, still extant, which belonged to Cardinal Wolsey.

Design XVIII.— *A Villa Residence, in the Tudor or Old English Style.*

1832. *Introductory Remarks.* This Design has been contributed by an able and zealous architectural critic, W. H. Leeds, Esq., the stores of whose portfolio evince him to be as proficient with his pencil as with his pen; and we shall give his observations upon it in his own words: — "Whatever merit they may possess in themselves, very few published designs are at all satisfactory as regards explanatory description. The greater number, indeed, are lamentably deficient in this respect; so that the Architect's ideas would be but imperfectly elucidated, by even a more copious graphic illustration than it is usual to give. It very rarely happens (at least in English publications of the class here alluded to) that any notice is taken of the interior of a building; or, at most, only a general section of it is exhibited, as if the interior of a residence required no other consideration than that of plan alone, nor afforded any scope for the display of taste and invention. This extreme reticence, whether arising from the excess of modesty, or the opposite quality, is not only sufficiently provoking in itself, but tends to deprive architectural works of this class of the interest they might be made to possess; so that, at present, they have rarely attractions for any save the professional man, or the devoted amateur. It will, perhaps, be said, that a design ought to speak sufficiently clearly for itself, without any assistance from the pen, or interpretation on the part of the Architect. Were every part completely displayed, this might be the case; but, even then, the Architect's silence might be a positive injustice towards himself, since, for want of stating his own views, or the circumstances by which he was directed, he may be criticised for not having done what it was out of his power even to aim at; and, on the other hand, he may obtain no credit for having surmounted difficulties which, because they have been felicitously conquered, may not even be suspected to have existed. Besides all this, there are a variety of collateral circumstances which, although it may not be indispensably necessary that they should be noticed, might very properly be pointed out, certainly without in any degree diminishing the interest of the Architect's performance. If the author of a design do not care to explain his own ideas — which, it is to be presumed, he must be better acquainted with than any one else, he can hardly expect that others will take the pains to investigate them very studiously. In an article entitled '*A Visit to Monplaisir*' (see *Library of the Fine Arts*, vols. ii. and iii.), I lately gave a description, at some length, of an imaginary mansion. The present Design is far more sober in every respect: there I indulged in rather lavish extravagance of embellishment; particularly in those favourites of my imagination, the four transept galleries, and the 'saloon of the four oriels:' here, upon a moderate scale, not exceeding that for the residence of a private gentleman of fortune, I have had some regard to economy, although greater attention has been had to decoration and effect, than is observable in many houses of much greater extent. By no means does it follow, that embellishment is to be regulated according to the actual size of the structure; nor is there any reason why architectural elegance should not be aimed at in a private residence, merely because the owner does not keep up an establishment equal to that of a nobleman. There is no province of his art which opens so delightful and varied a field to the Architect; none which affords him so many captivating combinations as Domestic Architecture, provided he possess any imagination or invention, and be at all at liberty to display them. What my own notions are on this subject may be partly gathered from some hints thrown out in the introductory chapter to Mr. Britton's work entitled '*The Union of Architecture, Sculpture, and Painting;*' which, together with the greater part of the remaining letterpress, proceeded from my pen. To that publication I must refer those who care to learn more of my opinions on this point.

1833. *General Description.* The present plan was originally designed for a villa in a very different style of Architecture, namely, the Grecian. It would then have had an advanced but enclosed Ionic portico in the centre, distyle in antis (a portico of two columns, between pilasters), flanked on each side by a lesser colonnade, exhibiting a different example of the same order, and raised upon a stylobate (pedestal) concealing sunk areas. The walls behind the columns would, in this case, as a specimen of decoration unusual in this country, have been painted with subjects in fresco; the space between the walls and these lateral colonnades, which would have been two columns in depth, having skylights so as to protect the paintings from the weather, and yet throw down the light upon them, which would be relieved by the shadow of the inner columns, and that of the soffit. The centre portico would have exhibited quite as striking a deviation from usual practice, inasmuch as the back or inner wall would have risen no higher than the vestibule, so as to admit a view between the antæ (pilasters),

insulated in the upper part of their shafts, to the wall bounding the open space beyond, and from which the vestibule itself would have been lighted from above. Thus, much effect of light and of perspective would have been obtained, together with a novelty of character seldom, if ever, aimed at in such parts of a structure; all our porticoes, however they may differ in other respects, being nothing more than a single row of columns before a wall. (See an *Essay on Porticoes*, in the *Library of the Fine Arts*, vol. i.) Although this description may appear quite irrelevant to my present subject, I trust that, on consideration, it will not be deemed so; because it may not be altogether uninteresting — to some, at least, to note, as far as they can do so from what has just been stated, the changes occasioned by adapting a plan exactly the same in dimensions, and in the arrangement of the principal floor, to a style requiring in many respects so opposite a mode of treatment. In either instance, my aim has been, to combine architectural effect with as perfect convenience as possible, and, while faithful to the general character of the style, to impart to the Design a tolerable degree of originality. It is not enough that there be a certain air of architectural propriety; there must be *feeling* and *flavour* likewise. It is far better that there should be a strong relish, though even of a questionable quality, than those insipid decencies which it is hazardous to censure, yet utterly impossible to commend; tolerably correct, perhaps, yet most intolerably dull.

1834. *General Plan.* In the annexed sketch, fig. 1585, which is intended rather to

1585

convey some idea of the relative localities as imagined by myself, than positively to determine the choice of site, it will be seen that the house, *a*, is placed at a moderate distance from the road, *b*, which, as there is no direct view from any of the principal apartments on that side, is not at all objectionable. On the west side, fronting the drawingrooms, &c., are parterres and pleasure-grounds, *c*; and on the opposite side is a paddock, *d*, screened from the road by trees and shrubberies. On this side, too, is placed the general entrance to the offices, *e*; and, in order to obviate, in some degree, the disadvantage of placing the kitchen offices in the basement story, while the conveniences of such a plan are retained, the ground is here supposed to fall abruptly; so that, if any descent at all be required, one or two steps leading down to that entrance will be sufficient. Should such a plan be selected for a level site, either an artificial declivity must be formed in the same place, or else a commodious area. On the north side of the house is the kitchen court, *f*, on the same level with the offices themselves, consequently much lower than

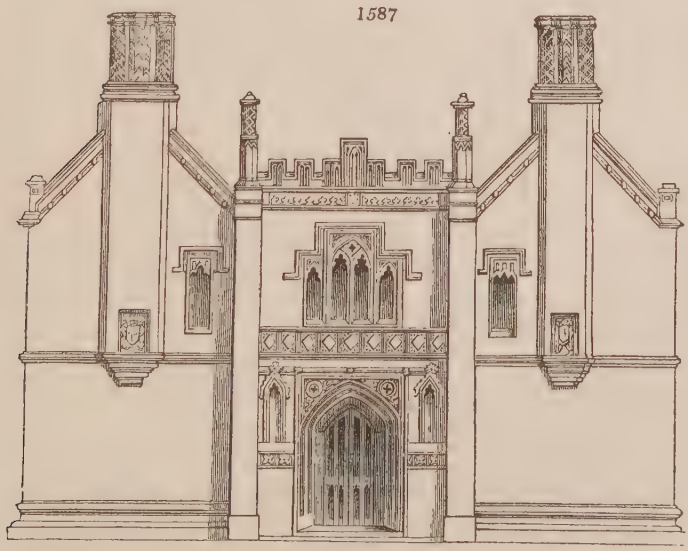
the other ground. Immediately attached to this are the stables, *g*, and such other buildings of that description, *h*, as the particular establishment kept up may render necessary. In this direction may be the kitchen and fruit gardens, and the orchard, adjoining the more ornamental grounds, *i*. All this might be accomplished within a very moderate compass of land, not more than is usually attached to a country residence not seated in a surrounding demesne of its own. Having thus, as far as it is practicable to do so beforehand without any positive data, put these particulars into some kind of tangible shape, the different elevations and the external character of the house are next to be considered.

1835. *The Entrance Front* is shown in the perspective view, fig. 1586, and in the

1586

elevation, fig. 1587. The lower part of this front is little more than a plain unbroken surface, with no other finish than that imparted to it by the base mouldings below and the ornamental string-course above. The recessed porch seen in this front is certainly of a richer character than is usually given to porches in private

1587



residences erected in a similar style; yet, so far from being out of keeping with the blank surface on either side of it, it both gives to, and receives from, the latter an additional value; namely, that of harmonic contrast. The eye is at once directed

to the centre, which is rendered of sufficient importance in itself to fix the attention, and prevent any sense of nakedness that might else be occasioned by the display of so much blank surface; while the latter produces not only the pictorial quality termed breadth, but repose likewise, and thereby relieves and sets off the somewhat floridly decorated centre. Were the same degree of plainness extended upwards, the result would be monotony and baldness rather than simplicity: to avoid this defect, the chimney shafts are made prominent and appropriately characteristic features in the upper lateral divisions of this front. While they immediately and distinctly announce, even in the mere elevation, that we behold a domestic habitation, they pleasingly diversify the surface, carry up the eye to an apex on either side, and serve also, by the moulded splays below them, to break the squareness of the lower divisions, and to dovetail, if I may so express it, the inferior and superior portions of the elevation together. The splays, and the ornamental panels with coats of arms immediately above them, are indeed essential points in the composition, unaffected as decoration, and withal congenial to the style here generally followed; although the particular combination here adopted may probably offer to other eyes than my own much that is questionable. The clusters of enriched chimney-pots which terminate the shafts preserve a due balance in the general scheme of decoration with the porch below; and, at the same time, in combination with the gables with which they are as it were incorporated, and with the pinnacles that crown the buttresses, produce such a diversity of outline as by that single circumstance alone to impart a more animated character to the *ensemble* than it would otherwise possess. On the upper floor there is a smaller window on each side, between the chimney shaft and the buttress. As regards the interior, these windows might certainly have been dispensed with without particular inconvenience; yet, even although the plan had been in every respect as good without them, they are of so much importance to the elevation, that either they, or something similar, ought to be introduced in that situation. Were it not for them, not only would the upper part seem too much a repetition of that beneath, but the centre and sides would appear like three upright divisions, the former of which would be pierced by an opening above and below, while the two latter would be an almost plain surface. By these two windows being thrown in, the eye is directed horizontally, and by the numerical increase in the features a slope is formed upwards from the porch to the summit of the chimneys, producing an inverted pyramidal figure opposed to the outline of the gables. There is likewise a pleasing kind of numerical harmony, yet without the least formality, obtained by the same means: below, there are three voids combined in the centre compartment, viz. the porch and two niches; above, there are likewise three, the larger and the two smaller windows, stretched out on a wider line; and the same system of triplicity is observed also in the composition of the centre window, and in the gables and ornamental embattlement which crowns the middle division of the elevation. Another circumstance, which deserves to be pointed out, is, that these two windows not only give a certain piquancy of expression to the general physiognomy of this front, suggesting the idea of some degree of intricacy within, but serve likewise to produce an agreeable symmetrical irregularity; for, although each of the side divisions, considered by itself, is not perfectly uniform, the regularity of the whole composition is strictly preserved, and the two antagonistic qualities, harmony and discord, or symmetry and irregularity, completely reconciled. The last observation I shall allow myself on this part of the Design is, that, owing to these two windows, the character of lightness is in a similar manner combined with that of solidity, and the latter at the same time pronounced more decidedly than if these lateral divisions had no apertures whatever; because, there being only one window between the chimney and the centre, the plain space on the other side of the chimney indicates firmness where it is most wanted, both for actual propriety and artistical expression, namely, at the angles. Were the situation of the window reversed, the alteration would be materially for the worse.

1836. *The West, or Drawingroom, Front*, shown in fig. 1588, exhibits a different character, in regard to mere composition and actual physiognomy, from the preceding one, although decidedly of the same cast and style; and, like that, having little extraneous embellishment beyond what arises from the parts themselves. Neither has it that air of pretension so frequently affected in modern Gothic mansions, where almost all possible varieties of feature are huddled together; and sash windows, with no other badge of the general livery than mere label-mouldings, are mixed up with buttresses, turrets, towers, and embattled projections, till the whole looks more like an assemblage of fragments than parts of one and the same design. For what effect it may possess, this elevation depends chiefly on the windows and their disposition. The five lower ones, which are those of the two drawingrooms, are level with the low terrace upon which they open, and from which there is a grass slope, on the same angle as the steps; there being no parapet, except at the end; because the terrace itself is so low, that any sort of parapet, while it would have interfered with the prospect from the rooms, and have been no

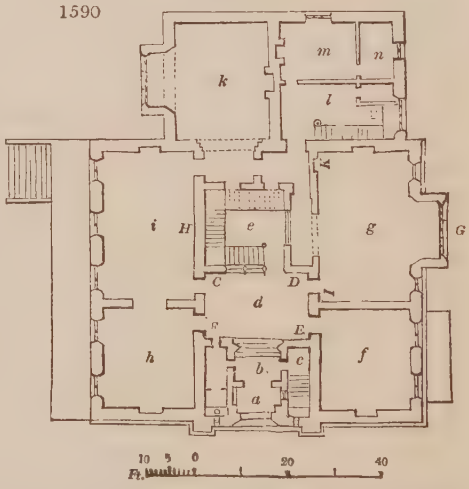
improvement to the external design, would have had a degree of heaviness not very consistent with the character of the place itself. On the upper floor there are but three windows; for otherwise, as this portion of the elevation is quite flat, without any breaks or divisions, two series of windows, exactly the same in number and position, and differing in little more than their heights, would have had a formal, monotonous, and also crowded appearance, not very agreeable in itself, and certainly not befitting the particular style here aimed at. This, I am aware, will be reprobated by those who consider it unorthodox to place a solid in one floor, over an aperture in that below. Without appealing to actual examples, as authorities, I shall content myself with observing, that, if it be imperiously required, in the case of windows, to have a perfect correspondence of opening over opening, and bearing upon bearing, the principle ought to hold good in all other instances; yet, I have never seen or heard it remarked, as a solecism or defect, where a lofty and almost solid mass has been erected over a gateway. Neither is it considered any violation of this principle, to have either one or more doors, or other apertures, in the lower part of an otherwise blank side of a building, where there is solid brickwork carried up to the height of, perhaps, several stories above. At least, let us be consistent; and, if the want of bearing under bearing is to be accounted a solecism even in a style where such licenses seem natural and characteristic, let us boldly say, that Sir Christopher Wren has been guilty of it to a most enormous extent, in the very finest of all his works, our metropolitan cathedral, where he has carried up a second order of solid masonry over one pierced with large windows; and, strange to say, although some critics have ventured to question the propriety of a second order at all above the first, not one seems to have noticed this circumstance. — The dormer windows of the attics, which seem to spring up from between the battlements, give character and variety to the upper part of the elevation, and possess sufficient embellishment in their gables, with crockets and finials (crockets are studded or curled ornaments, running up the upper edge of a gable wall or pinnacle, and terminating in a pointed ornament or finial), to be reckoned among the decorative features of the Design. The circumstances of the plan — which, as I have already observed, was predetermined for another design, rendered it rather difficult to give sufficient character to this side of the building; and perhaps it would appear somewhat tame and insipid, were it not for the receding portion at the north end, which gives variety and support to the whole. This is treated independently of the rest, and kept somewhat subordinate to it; almost all its decoration consisting merely in the bay window of the library, and the group of chimneys on the roof.

1837. *The Dining-room, or East, Front* is shown in the perspective view, fig. 1586. and in the half-elevation, fig. 1589. Although there is much similarity, in many respects, between this front and that described, it is by no means a repetition of the latter. It is more irregular in itself, owing to the inequality of the ground, which, as already noticed, has a considerable descent on this side of the house, to the north-east angle; in consequence of which, the building here seems to gain an additional story. As the bay of the dining-room produces a sufficient diversity between the upper and lower floor, five windows are here given to the former, for the sake of deviating from the arrangement observed in the west, or drawingroom, front. Another difference is, that the lower windows do not reach quite down to the floor of the rooms, there being an area beneath those of the breakfast-room, and the others being at some distance from the ground. The portion

1589

to the right, or north, which answers to the library in the preceding elevation, but does not retire back so much beyond the general line of the front, is so treated as distinctly to mark it as being of a subordinate character; yet so that, while it tends to set off the rest, it is sufficiently in keeping with it. The features are plainer, but neither neglected nor destitute of a certain sobriety of adornment; and the solidity of the lower part, in which there is only the door, forming the entrance to the offices, is as valuable for the effect it produces to the eye, as it is desirable in itself.

1590

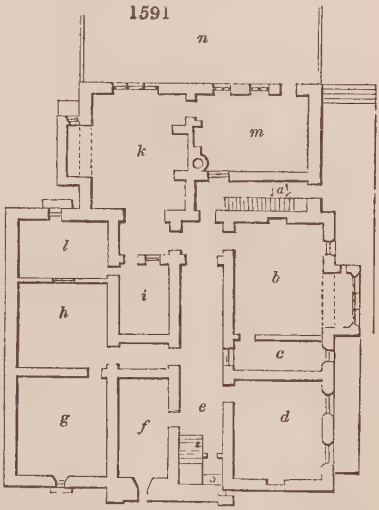


1838. *The Ground Floor*, fig. 1590. In this plan, the porch, *a*, eleven feet by five feet six inches, opens into an inner porch or recess, *b*; adjoining to which is a small staircase, *c*, leading down to the servants' hall, &c. In *b* are a few steps, forming an ascent into the vestibule, *d*, twenty-one feet six inches by fifteen feet. Beyond this (from which it is detached by an open screen) is the staircase, *e*, seventeen feet square, and thirty-four feet to the summit. On the right of the vestibule is a breakfast, or morning, room, *f*, twenty feet six inches by nineteen feet; and, next to this, is the dining-room, *g*, thirty-two feet by nineteen feet, with a bay window on one side, and an alcove for the sideboard opposite it, making the entire width, including these two recesses, twenty-nine feet six inches. On the opposite side of the vestibule are two drawingrooms, *h* and *i*, twenty feet six inches by nineteen feet, and thirty-two feet by nineteen feet, communicating with each other by folding doors, so as, when required, to give an extent of upwards of fifty feet. Communicating with the larger of these, but not in a direct line, is the library, *k*, twenty-

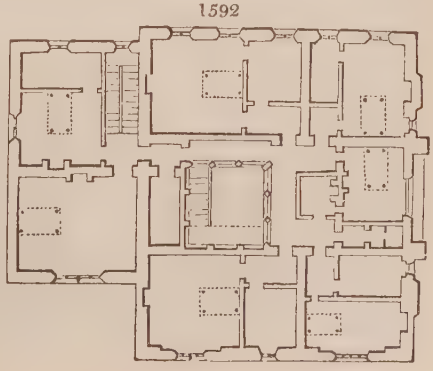
four feet by nineteen feet, exclusive of the bay, five feet deep, and of the entrance recess, eight feet two inches in depth. Behind the library, and beyond the dining-room, is the back staircase. *l*, from which access is obtained to the vestibule, through the other staircase. Adjoining *l* are the butler's pantry, *m*, and his bed-room, *n*. The height of the rooms on this floor is fourteen feet six inches.

1839. *Plan of the Basement Story*, fig. 1591. Either descending the back staircase, or entering by the door seen in the east elevation, fig. 1589, there is, first, a small lobby, *a*, lighted by the window over the door, those on the staircase, and one, at some distance from the floor, in *m*. Next comes *b*, the housekeeper's room, with a store-closet, *c*. Both these are under the dining-room; and the first has a bay window, with a side light, through which whoever comes to the private entrance may be observed. The servants' hall, *d*, is under the morning room, and contiguous to the stairs at the extremity of the passage, *e*, which lead directly up to the inner porch and vestibule. By means of this staircase some light is admitted into the passage at this end of it; and, besides what it receives from *a*, and through the window in *m*, it obtains some from the window (near the ceiling) in *c*, and from the servants' hall, the door of which is glazed with ground glass. The letters *f*, *g*, and *h* indicate three cellars; viz. for coals, wine, and beer; *i* and *l* are pantries; *k*, the kitchen; and *m*, a scullery, or back kitchen, opening into the kitchen court, *n*, where there might be an additional place for coals and wood, for the service of the kitchen, &c., and for whatever further accommodation and convenience should be found necessary, as the extent of this court would be *ad libitum*. Since it will be hardly necessary to advert again to this plan, we may as well make here, at once, the few observations that seem called for. The kitchen and scullery, being towards a spacious court to the north, would be as well situated as if they were entirely above ground; while no inconvenience would be experienced from their present position, as their windows are in another side of the house from that in which is the bay of the library; neither are there any windows or areas beneath the drawingroom windows. The housekeeper's room is well situated for observing all that goes on below stairs, being placed near the entrance and back staircase, and between the kitchen and servants' hall. Although, too, the door of her room directly faces that of the kitchen, yet, owing to the plan of the latter, the view into it would not be so direct as to prove awkward or disagreeable. The servants' hall is equally advantageously placed for immediate access to the vestibule, and, consequently, to any of the rooms, by means of the stairs leading up from that end of the passage. Were it not for these stairs, the servants would have to traverse the whole length of the passage, pass up the back stairs, and then return again through the other staircase and vestibule, in order to reach the entrance door, or the drawingrooms. It is hardly necessary, then, to point out the convenience of having a coal-cellar immediately by these stairs.

1591



1592



1840. *The Chamber Floor*, fig. 1592. On this floor there are five principal bed-chambers, with as many dressing-rooms, or at least dressing-closets, attached to them, and instead of opening directly into a common corridor, each separate apartment has its own lobby, whereby greater privacy and quiet are secured. Instead, too, of forming a

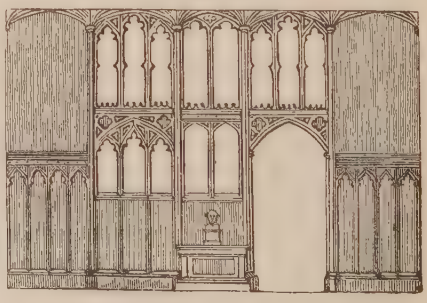
spacious landing or vestibule on this floor, where it would have been rather out of character, and would have seemed too much a positive loss of room, a dressing-room lighted by a sky-light has been made out of this void above the vestibule, by which means two perfectly distinct corridors are formed, one on the east, the other on the west side; whereby not only some degree of intricacy is given to the plan, but the entrances to the rooms are less exposed. There are also two other chambers on this floor, next to the back staircase; one over the library, which might be used as a nursery, or as a double-bedded room for children; the other the housekeeper's sleeping-room, with a light closet attached to it. In the space between the former of these rooms and the principal staircase, which should have double doors, the outer one being made to appear like the rest of the wall, the most valuable part of the plate might constantly be kept, it being at so short a distance from the butler's pantry and dining-room, while the place itself is such as almost to secure it from the possibility of robbery; for the housekeeper's bed-room is close by; and that of the butler, on the floor beneath. By means of a little contrivance, this closet might be rendered a place of still greater security, such as to render robbery, unless by some extraordinary conspiracy among all the servants themselves, hardly possible. Instead of making a single closet, it should be formed into two by a strong partition; and in this partition there should be, not a door, but a panel that would slide up, and which would be well secured by locks; the keyholes to these locks being themselves concealed by a smaller panel or metal plate, removed by touching a secret spring. After whatever was wanted to be deposited there had been put into this inner closet, and all properly secured, a frame of shelves made so as readily to fix on, would be put up against the partition, and articles of inferior value set upon them: thus no one could have any idea that there was another closet beyond the first. To render 'assurance doubly sure,' there might be a wire communicating with an alarm bell on the roof of the house to hook on to the outermost of the two doors to the first closet, so that, should only that be forced open, the robbers would think it time to decamp; or, should that not have the desired effect, but they actually obtained admission, a few handsome-looking plated articles in the first closet would be seized upon without suspicion.

1841. *The Plan of the Attics* will be sufficiently understood from that of the chamber floor, and from the elevations. On either side there are three rooms, two of which are sufficiently large to admit of being double-bedded; and the passage leading to them is carried over the corridor below, turning off either to the right or left, till it comes over the northernmost of the lobbies on that side, where a door is made through the wall, continuing the passage over the other lobby; which variation of the plan is occasioned by the necessity for leads, and open space, on each side the skylight of the dressing-room in the centre of the chamber floor.

1842. *Detailed Examination.* The reader will now be able to form an adequate idea of the whole house, and the accommodation it affords; and, consequently, will be prepared for a more minute examination of such parts as stand in need of further description, or call for critical remark. We will therefore commence with the porch.

1843. *The Porch, Vestibule, and Screen to the Staircase.* In the porch are stone seats for the accommodation of servants, who may be waiting with visiters' carriages. Instead of the whole of the vestibule, and the doors of the several apartments, being entirely exposed to view immediately on entering, only the perforated screen on the opposite side, and the upper part of the staircase beyond it, are shown. It is perhaps, rather a favourable circumstance than otherwise, that, in order to obtain sufficient room for the stairs, it was necessary to place arch the opening into the staircase at one angle; since the staircase is now less exposed than if that arch had been in the centre; and, while a sufficient degree of symmetry is kept up, upon the whole, this species of irregularity is by no means disagreeable. Owing to this, too, the screen, fig. 1593 (which is a section on the line C D), is perhaps more decidedly expressed as such to the eye, at the very first glance on entering, or as viewed through the glazed door of the porch, than it would have been had the opening into the staircase been facing the entrance. While the utility of, or rather the necessity for, this screen is obvious, both because a perforated partition is required here, since the vestibule receives its chief light from the staircase; and

1593



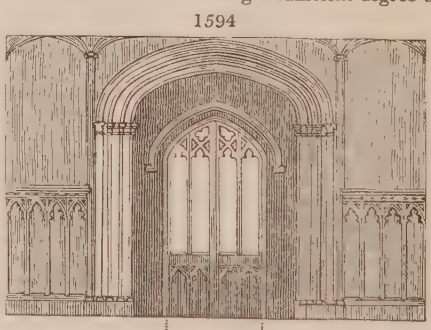
because, for the reason already assigned, only the upper half of the partition could be so pierced; this screen becomes a striking feature, gives character to the Architecture, and produces a pleasing degree of scenic effect, without seeming liable to the reproach of making a more ambitious display than is consistent with the rest of the mansion. On the contrary, it rather serves to moderate the quality of mere space; for, while it permits the eye to catch a partial view of the staircase, and the arches of the corridor above, in a manner well calculated to interest the imagination; it also strictly defines the limits of the vestibule, so that this shall not appear too large; yet, as far as picturesque effect is concerned, have all the advantage arising from the space beyond it, and with which it thus becomes in some measure identified. To many, I am aware, the kind of merit I am willing to impute to the Design, in this respect, will seem a most extraordinary one. They cannot comprehend how, under any circumstances, a limited space can be preferred to a more extended one, magnitude and mere size being, in their opinion, positive merits, for the sake of securing which, we are at liberty to make sacrifices that no other consideration could justify. Such persons forget — in honester language, they have yet to learn—that in Architecture many beauties are entirely relative and conditional; that what is an advantage in one case may in another become a defect; and that, consequently, it is necessary to consider what it is that actual circumstances render most eligible. The most obvious is not always the greatest advantage; nor is the most unquestionable kind of beauty invariably the happiest that could be adopted.

1844. *The Vestibule.* In a house of this size, any thing beyond a mere vestibule would be rather out of character; the vestibule here is not therefore treated as a hall, occasionally to be used as any other room, or as having such appearance; because, after all, such a place will rarely, if ever, be so used, according to the present style of living. For this reason, it professes to be nothing more than an approach to, and communication between, the different sitting-rooms. Hence, it is on every account desirable that, while this entrance sufficiently answers the expectations raised by the exterior, it should not even seem to occupy too much space; or become so important by its size, as itself to excite expectations the plan would not allow of being realised. It is obvious that, but for these considerations, it might have been made considerably larger, and that, too, without any difficulty or study; or rather, with far less study and thought than have now been bestowed upon it, by merely taking in the whole space, instead of abridging it in the manner here adopted. Equally obvious is it that this would have been attended with material drawbacks, as far as mere convenience is concerned, because then either the staircase immediately communicating with the servants' hall in the basement must have been omitted altogether, or have been exceedingly awkward and confined, and the door from it must have opened immediately into the hall; whereas it is now so situated as to be perfectly out of the way. In like manner, the water-closet, which now occupies the corresponding space on the other side, could hardly have been introduced in such a situation; as it must have opened immediately into the vestibule, and the door would have been almost contiguous to that of the porch. Independently, however, of these circumstances — granting that such change would not have interfered in the slightest degree with those parts of the plan, still the alteration would be materially for the worse as regards effect. According to the present plan, the view is confined, framed in, if I may so term it, by the sides of the inner porch, in such a manner that the whole of the vestibule, and the doors opening into the apartments, are not exposed to sight as soon as we enter the house; which, certainly, must be allowed to be rather an advantage than otherwise. A pleasing air of variety — intricacy it can hardly be termed, is likewise produced by this combination of inner porch and vestibule, instead of the whole being thrown into one space; and this effect is again heightened by the difference of level, slight as it is, between the floor of the one and that of the other. Another point in favour of this arrangement is, that, on the one hand, the recess or interior porch contributes by contrast to the importance of the vestibule, which is thus made to seem to expand; and, on the other, instead of appearing, as it actually does, to abridge the extent of the vestibule, it rather conveys the idea of so much space being added to it. Let us now consider what would be the result, were the other mode to be adopted, and the whole space included in the vestibule. Besides the loss of those positive advantages, and of that degree of effect now obtained, by converting the vestibule into a mere simple parallelogram, twenty-one feet and a half by twenty-three and a half, which would then be its dimensions, it would be rendered larger than either the breakfast-room or the corresponding drawingroom on the opposite side; consequently, would detract from their appearance, and make them seem comparatively insignificant apartments: in the next place, it would become too wide for its height: and, thirdly, it would then seem dark and gloomy; for, although it has light enough for what it now is, a mere *pièce de communication*, it would not have sufficient, if converted into a larger room, which would

require a few articles of furniture, in order to prevent its looking absolutely naked. At present, one or two chairs, and a slab table with a large bust, or something of the kind, standing upon it (and perhaps a rich carpet cover partly thrown over the slab, by way of presenting some object for the eye to dwell on in the centre of the screen), are quite sufficient. Taking all the above circumstances together, they furnish very sufficient reasons for giving the preference to that disposition which has been adopted in our Design. There is, however, still another point to be considered, and this is one that has not been without its influence in determining our choice, even had every thing else been nearly balanced on both sides. It is evident that what are now the ends, or shorter sides, of the vestibule, would have required to be very different, had any other plan been determined upon. Either there must have been a sham door, to correspond with that of the dining-room, or the door opening into the breakfast-room, and that into the opposite drawingroom, must, instead of being at the angle, have been in the centre of the side of the room. Were the former method adopted, there would be three doors on each side of the vestibule: so that the centre one would look like that of a mere closet or passage; as there would evidently not be space for any thing wider, between the two other doors: besides which, the whole would have had a crowded appearance. If, on the contrary, the other mode were preferred; as far as regarded the vestibule, no objection would arise; but then the two rooms to which those doors belong would be far from being improved by such a change; for, as they are not very spacious, by placing the door in the centre of the side opposite the windows, we should bring them too near the fireplace end of the room, where persons most generally sit; besides too much exposing, both to observation and to currents of air from the door, the centre of the apartment, where there would most likely be a table. The objection would not be altogether so great, did the door communicate with another sitting-room; but, as it would open from the entrance hall, the comfort of the room would thus be considerably diminished.

1845. *Three Sides of the Vestibule* (for the one in the section exactly resembles that opposite it) have now been shown, and in the elevation of the fourth, fig. 1594, is seen the arch opening from the inner porch. For the sake of obtaining a sufficient degree of general symmetry between this and the opposite side, both in the elevation itself and with regard to the rib-mouldings on the ceiling, a slight break is made in the wall in which the arch is placed, so as to have exactly four panels to the right and left of it, as is the case with the screen. Through the arch is seen the entrance door, with dotted lines continued below it to point out the level upon which it is placed. The upper panels and tracery of this door are glazed, for the purpose of affording additional light to the vestibule besides what it receives from the staircase, so that it would have quite as much as is desirable; because a *demi jour* here will set off the adjoining rooms so much the more advantage. As the external door is glazed, there must, for greater security, be an inner door, with a double fold on each side like a shutter, so as to fall completely back into a hollow in the wall made to receive it; and this would be closed, and firmly fastened to, every night. It has not been thought necessary to show this in the elevation, because, unless on such a scale as to exhibit all its details of construction, it would be of no use; and, besides this, there would be nothing to indicate it as to appearance: for these shutters on each side of the door would be quite flush with the wall, and be plain surfaces, coloured exactly to resemble the wall itself; consequently, they would hardly be at all distinguishable from the rest of it. Or there is still a better mode to be adopted: this is, to shut up the porch itself every night by a strong *porte-coulisse*, contrived to slide forward on either side from grooves made in the wall, in a hollow between the vertical mouldings of the archway of the porch. This door would be fastened from within, and externally would present no lock, or any thing of the kind, by which an attempt might be made to force it open. Another advantage attending this latter mode is, that the porch would be kept quite dry from rain during the night; and this door might likewise always be closed whenever the family were not resident in the house. It must be admitted that this scheme would be attended with some difficulty in the present plan, which would require a door of this kind to be formed of several

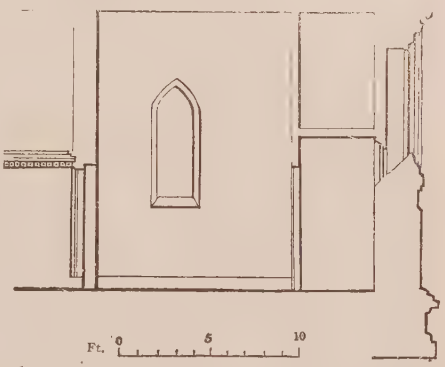
1594



parts sliding behind each other, there not being sufficient space for half of it on each side, a window being in that situation, as will perhaps have been noticed in the ground plan, although none appear there in the elevation.

1846. *The Invisible Window.* The lower part of the walls of the vestibule are paneled for about seven feet from the floor, and the two centre panels, to the right of the arch in fig. 1594, form a concealed door, opening into a passage lighted from the porch, and leading to a water-closet. Both this latter and the staircase on the other side of the porch are lighted through the external niches, by the very simple contrivance exhibited in fig. 1595. It will now be perceived that these niches are something more than mere architectural ornament; that they are of direct utility; and, although small windows might certainly have been employed in this instance, niches must be considered preferable to them, because the others would, besides cutting up and destroying the breadth of the composition too much, have clearly indicated that there was some small closet or other just here. Now these apertures are completely concealed, and, by being made to slope downwards, transmit the light more directly than common windows of the same dimensions would do in a wall of the same thickness. In regard to the situation selected for this water-closet, some difference of opinion may be entertained as to its propriety. Many will say that the door leading to it is too close to those on that side of the vestibule; and so, undoubtedly, it would be, were there not an intervening passage, which removes much of what might be considered objectionable.

1595



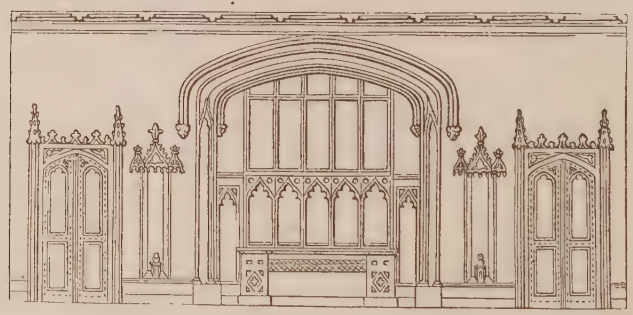
1847. *The Staircase.* Although this leads only to a few sleeping-apartments above, and would rarely be ascended by visiters, as the house itself is not upon a scale to afford much accommodation for resident guests, it being more of a villa than a mansion, it has been thought proper to render it one of the most effective parts of the interior, as well because it forms the approach to the library, as because it would be very conspicuous from the vestibule, whence it would be viewed through the open screen. The staircase is a square of seventeen feet by thirty-four feet in height, or a double upright cube. On two of the sides are three open arches, and on the others three blank ones to correspond, so as to produce perfect symmetry of design. The ceiling is arched and groined, with fans at the angles; and the upper panels of these latter, together with the compartments formed by the intersecting ribs of the groining, are filled with ground glass of a warm tint, just sufficient to shed a mellow Claudish glow over the whole space. Above this transparent roof is a second external skylight, which not only serves as a protection to the lower one, and to exclude wet more completely, but helps to preserve a more equable temperature on the staircase, which, together with the vestibule, might be warmed by hot air, steam, or hot water. By lining the walls in the space between the upper and lower skylight with white glazed tiles, the light would also be considerably increased, and powerfully reflected down; and as there would be a small door from the passage leading to the garrets opening into this intermediate space (which door would, of course, always be kept locked, to prevent the possibility of accidents, by any one incautiously stepping out), the under skylight could at any time be cleaned and dusted with very little trouble; a plank, or some small machine constructed for that purpose, being laid on the ribs of the ceiling, to securely support the person so employed. As to the decoration, it may perhaps be thought in too expensive a style, yet would in reality be far less costly than it appears; for most of the ornamental work would be of cast iron or composition painted to resemble stone; and, as their situation would preclude the possibility of their being closely inspected, the embellishments might, with very little actual finish, be made to appear even elaborately wrought. Were the staircase rather more spacious in itself, and did it also lead to a number of bed-chambers and dressing-rooms for strangers, the compartments formed by the blank arches might be painted either in chiaro-scuro or fresco, as their subjects could be distinctly viewed from the open corridors, with which they would be upon a level; yet, such not being the case, it would hardly be worth while to do so; and most readers will perhaps be of opinion, that there is already

quite embellishment enough bestowed upon this part of the interior, to be consistent with the rest of the house. We will now enter the sitting-rooms.

1848. *The Morning Room* calls for hardly any remark: it should be simple and unpretending, aiming merely at cheerfulness of character. The walls might be of a pale sea-green tint; the window-curtains either of the same hue, but rather darker; or, if contrast in this respect, and in some other parts of the furniture, should be preferred to uniformity, buff, orange, or some colour of that kind, lined with a still paler green than the walls. A few paintings, or choice prints, with an upright piano, might form part of the furniture of this room.

1849. *The Dining-room.* In its general dimensions, this room is of the same size as the larger drawingroom on the other side of the vestibule, viz. thirty-two feet by nineteen feet; but, by the addition of the alcove for the sideboard, and a bay window opposite, its extreme width across the centre is increased to twenty-nine feet and a half. By this means a sufficient difference both of form and extent is obtained; nor is the one apartment, in any respect, a mere repetition of the other. We have seen how far the bay window contributes to architectural character externally in the elevation in the east side of the house, fig. 1586; but it was originally suggested entirely by circumstances belonging to the plan, it being judged desirable to combine here as perfect a symmetrical arrangement as possible, with variety and extent. Towards the room, both the bay and the alcove present uniform openings, for their arches are perfectly alike; and this similarity is still farther increased by their having sliding curtains hanging within the arch; in order that, when drawn close, none of the architectural features of the room should be concealed. The window of the dining-room, behind the recess for the sideboard, is proposed to be carried up higher than the arch within the room; a disposition contributing to variety of effect, and in many cases preferable to that of making no division between the ceiling of the bay and that of the room itself. Except what regards these two recesses, very little is to be learned from a section of this room, beyond its general proportion. Here I may remark, that, although it has not been done in the plan, there would be no great objection to forming a central door of a handsome character, rather larger than the others, at one end of the apartment, opening from the breakfast room, so that the latter might, at a large dinner party, serve as an anteroom, from which this might be entered. In such case the first *coup d'œil* would undoubtedly be far more imposing; and there would be far better keeping between the different sides of the apartment. The design of the doors on the alcove side of the dining-room, fig. 1596, it will

1596



be observed, is somewhat unusual, and rather more ambitiously decorative than a strict adherence to actual precedents in the domestic style would, perhaps, warrant. The chief part, however, that calls for detailed notice, is the alcove itself: this has somewhat less depth than could be wished, but quite as much as the plan would allow; still, if it does not, in this respect, produce all the effect that, under different circumstances, it might have possessed, it acquires some degree of architectural energy, if it may be so termed, from its being made an expanding recess. (By the epithet expanding I would designate any recess which is wider in itself than the opening towards the room; by rising, one whose ceiling is carried up higher than the soffit of the arch or opening. According to this vocabulary, therefore, such a recess as the present one, would be termed "expanding rising," by which simple terms two important circumstances would be distinctly expressed.) By employing this kind of recess, greater variety of perspective and a pleas-

ing degree of intricacy are obtained. Some indication of a sideboard is introduced in the sketch, rather for the purpose of serving as a scale, and showing how it would come in, than of giving any positive idea of its design. In order to give a definite expression to the recess, and to keep it rather distinct from the room, the lower part of the wall is wainscoted and paneled; and the panels at one extremity of it form the door by which the servants enter to serve up dinner, and which is in a straight line with the butler's pantry. Thus, when it was closed, there would be no appearance of a door at all; and even when opened it would be hardly observable; nor could there be any draught from it into the room, as it retires so much beyond the opening of the arch. Without verbal explanation it would be impossible to understand what the compartment above the sideboard itself really is: it is, therefore, any thing but superfluous, to inform the reader that the divisions between the mullions would be filled with mirror, so as to form, in appearance at least, a kind of window, answering to, and reflecting, that in the opposite bay. Mirrors, indeed, very seldom form any part of the embellishments of a dining-room; yet, when applied as they are here, they assume altogether a different character from their usual one, as articles of furniture. Considerable light would thus be given to the alcove, and the idea of spaciousness greatly heightened; while a striking vista would be created, as seen from the bay. In the evening the effect would be still more brilliant; for then the lights on the sideboard, and those of the chandelier (suspended from a richly carved boss in the centre of the middle compartment of the ceiling), would be vividly reflected in this mirror window. So far, however, there is no great invention shown; for—I do not know whether in this particular style or not, or exactly in such a situation—apparent apertures formed by mirror, and other effects, have been frequently executed on a considerable scale. We must now see, therefore, whether we can hit upon any other device that shall produce additional effect. Each panel of the upper series should be made to draw down behind the lower one, like a common window-sash; which being done, there would appear a series of rich compartments of stained glass, strongly illuminated from behind by lights within the staircase. Or a nearly equal effect might be obtained by painted blinds, executed in a superior and tasteful style. By this contrivance all the purposes of a music gallery would be answered, without any of its objections, since a harper, or one or two performers, stationed on the adjoining staircase, would be distinctly heard, without either seeing or being seen by the company. It has not been considered necessary to indicate this in the sections; for unless this stained glass was required to be exhibited, which would not be very often, it might be entirely concealed on the side towards the staircase by one or more sash-shutters, made to slide down behind the paneling on that side, and forming externally either ornamental compartments above the wainscoting, or made level with, and just like, the surface of the wall: thus the painted windows or blinds, as might be, would be enclosed between the mirror panels on one side, and the panels just mentioned on the other. The walls should be stuccoed, and coloured of a clear and warm reddish tone; and, in order to give the vivacity of decided yet harmonious opposition to them, the curtains would be fine merino, of a bright purple, lined with silk of rather a light red colour. The balance of colour throughout would be tolerably well preserved by the curtains within the arch of the alcove; and, in addition, there ought to be similar ones on each side of the mirror window, hanging down as far as the sideboard. The panels of the doors, too, might be covered with the same material, enriched with gilt studs; and, if this were done, the panels within the alcove also ought to be so covered. This wainscoting and the doors should be pale oak. As to the carpet, with the exception of a wide border, of a bold and rich pattern, where reds and purples would be the predominating colours, all the rest might be without any figure, and of some agreeable neutral tint; because, in a dining-room, when the table is set out, and the company seated, very little of the carpet is seen or noticed, so that it can contribute little to the general effect: the carpet alone, therefore, would form one marked distinction between an eating-room and a drawingroom.

1850. *Drawingrooms.* The vestibule, staircase, and dining-room exhibit several strictly architectural features, keeping up the character of the exterior of the house; but there is no reason for being particularly strict as to this, in these departments, which would possess sufficient *agrémens* of a different description; and where an air of cheerfulness, and the lighter elegancies which modern refinement has introduced, ought at least to be as much considered, as a rigid adherence to certain prescribed forms. Although, however, peculiarity of style would be here less defined than in the preceding instances, it would not be entirely laid aside, but merely lowered in its tone; it being still so far retained as to preserve a due degree of consistency throughout. The design of the windows, which are both transomed and mullioned, and have their compartments arched, requires such a degree of consistency; and these, with corresponding paneling in the window-shutters and doors, with hollowed corbel cornices, decorated at intervals by delicately carved blocks, and with ribs on the ceilings dividing them into compartments,

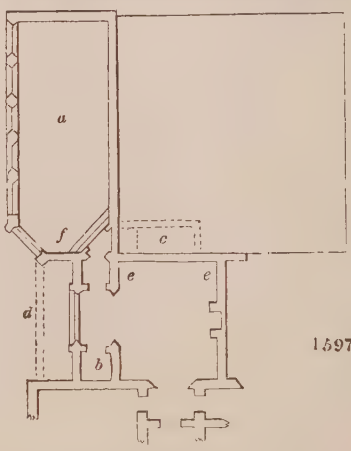
would almost suffice to produce architectural expression enough. The pattern of the carpet, too, might contribute to the same purpose, as would in some degree the general style of the furniture; yet an attempt to Gothicise the latter, even did every thing else seem to require it, must be strenuously deprecated. Backs of chairs exhibiting copies of church windows, and other things of that sort, are not only complete caricature, but downright vulgarities, hardly one remove from those Gothic patterns for paper-hangings, which no person of the least taste can look at with satisfaction. Both rooms would be furnished *en suite*, as they communicate by wide folding doors, so as to form one spacious apartment, larger than would, perhaps, otherwise be consistent in a house of this size. The doors themselves should be square-headed; but they might appear to be carried up higher than the real opening, forming a low arch, with tracery in the arched part of the doors. The doors themselves would be oak, with panels (as would be the case with those of the other doors) of choicer specimens of the same wood. Over each chimney-piece should be a lofty mirror, which might terminate above in an arch, with foils and cusps (small arches meeting in points, which are often used as an enrichment in tracery); and on each side might be a narrower compartment in the frame, divided by rich transoms, and each division filled with silk in flutes, and of the same colour as the window curtains. A framing of this description, which, as it would probably be wider than the mantel-piece, ought to seem to rise up on each side of it, and include that as a lower division of itself, would give the mirror more importance than, independently of such additions, its actual dimensions could do. The walls would be hung with either silk, or very rich paper of elegant designs, in which brown, fawn, grey, and ash tints, with a slight intermixture of positive red, should be so combined as to produce an effect rich and warm, yet sober and delicate. The hollow part of the cornice, and the sculptured blocks, might be picked out with deep red or scarlet, in which case the lower edge of the wall might have a border of the same colour. The general pattern of the carpet should present a combination of somewhat similar hues to the walls; but the border, which should be sufficiently wide to extend a little beyond the furniture, should be mostly of scarlet, and some other shades of red, to balance that colour in the cornice and window-curtains. These latter, which, like those in all the other rooms, would be without cornices or hanging draperies, and merely draw upon an ornamental rod, immediately below the cornice of the ceiling, would be of scarlet silk, lined with pearl-colour. There might be muslin curtains or not, in addition to these; but, in order the better to exclude the sun, to which from their aspect these rooms would be much exposed, there ought also to be spring blinds, made so as to be tightly fastened below at each angle. These might be made to contribute very materially to the general elegance of the rooms, by being painted so as to represent the windows themselves, with their mullions and transoms, but entirely filled with stained glass of a diaper pattern; or, this might be confined to the upper compartments, the lower ones appearing to be open, so as to show a continuous view through them, adapted to the natural horizon. Unless, however, this were done in a very superior style, and with perfect taste, it would be far more advisable not to attempt any thing of the kind; as, so far from being ornamental, it would be the very reverse. The mouldings of the ceilings, and the ornamental intersections, ought to be gilt; but merely partially, so as to exhibit rather sparkling streaks of gilding than entire surfaces of it; and the blocks in the cornice ought to receive the same embellishment, the edges of their foliage being just tipped with metallic lustre. Instead of a bright white hue, the ceiling and cornices should be of a cream or ivory tint, and perhaps varnished, so as to give it something of the character of the last-mentioned substance. On the sides opposite the windows there would in both rooms be space for sofas, besides other furniture; and against the window piers might be low cabinets, book-stands, or other articles of that description, with a few pieces of ornamental porcelain and *bijouterie* placed upon them. A few ornaments, tastefully disposed on the walls, would nearly complete the embellishments. In respect to pictures, there is one thing to be considered, namely, their size; for, however valuable they may be in themselves, small cabinet pieces or drawings can seldom be so arranged as to be placed in good situations for viewing them, and yet not interfere with the general effect of the room, supposing it to possess any ornamental character in itself. Should there be many of them, they must either form nearly a continued line, with a plain space above them; or many of them must be placed considerably higher than they ought to be, to be properly seen. If, on the contrary, there are only a few, comparatively with the size of the room, distribute them as we will, they will be apt to form spots upon the walls, and to look rather insignificant; in this case, too, their situations must be determined by the proper height for viewing them, and not by the actual height of the room. Even where there are many large and small pictures together, they can hardly ever be so well arranged as a regard to general effect requires; because, instead of the larger ones being so hung that each of them shall form the central point, as it were, around which smaller frames

should be symmetrically disposed; the former must inevitably be placed above the latter, and thereby create a certain disproportion and irregularity, by no means very pleasing in itself. These inconveniences might generally be obviated by placing pictures of small dimensions, whether there be any others in the apartment or not, in a pinacotheca.

1851. *The Pinacotheca.* As this piece of furniture is quite a novel contrivance, never before described, some explanation of it may not be unwelcome. It is a small upright cabinet, enclosed in front with a door of plate glass, to secure the paintings and their frames also from dust, and to prevent their being touched or accidentally rubbed against. Its depth need be little more than that of the frames of the pictures which are arranged in it one above another (not more than three or four), in such a manner as that the uppermost shall be exactly on the right level for properly viewing it. When a person wants to examine any of the lower paintings, he is able by a simple piece of mechanism to shift its place, and elevate it for that purpose; and, as the pinacotheca would stand upon castors, and be a light piece of furniture, it might easily be turned so as to catch the most favourable light. Besides being thus of express utility, pinacothecas might be rendered exceedingly ornamental pieces of furniture, both by their materials and their embellishments. We will decide, then, on having two in the larger drawingroom, either against the window piers, or one on each side of the folding doors at the end. Two rosewood cabinets of this description, lined within with crimson velvet, puckered, and surmounted by busts, with a rich socket for a wax taper on each side of them, springing up from the carved work at the angles, would form, independently of what they might contain, rather tasteful accessories to the rest of the furniture. With these two rooms a stranger would most likely judge that all the reception apartments terminated; at least, he would hardly suppose that there was another sitting-room; or, at all events, none of any importance beyond these, since he would rather imagine that the farther door must lead into some passage behind the staircase; consequently he would hardly be much dissatisfied with the plan, on discovering that

1852. *The Library* is so immediately connected with the drawingrooms as to form, although not in a direct line, a suite of three rooms all opening into each other. I cannot help considering this disposition far preferable to one that would produce merely a straight *enfilade*, certainly presenting a more imposing vista at the first glance, but exhibiting no art or contrivance, and keeping nothing in reserve to make amends for the monotony which would be felt after the first impression had subsided. In a very spacious mansion, where there is scope for great variety in other respects, a lengthened *enfilade* contributes to dignity: but here, considering both the size of the house and the limited number of rooms, it should rather be avoided than the contrary; because it would display almost the whole of the interior at once; whereas, by making a turn off from the direct line, and at an angle, where, from the known situation of the staircase, there seems hardly any possibility for communication with an adjoining room except through some passage, a pleasing degree of variety and intricacy is produced. The house, too, appears thus much larger than it really is; for even the mere circumstance of turning again from the recess into the library conveys an idea of distance and extent. Between the drawing-room and library should be double doors, so as to exclude all sound, and keep the latter room quite quiet, and distinct, as it were, from all the others on this floor, notwithstanding that it is so completely connected with them. Whichever way it be entered, whether from the staircase, so as to have a direct and central view on opening the door, or from the drawingroom, the effect would be pleasing, and somewhat picturesque. In the latter case, the effect would be even the more striking of the two; because, as the doors in the entrance recess would be paneled with mirrors, on opening that from the drawingroom, an apparent vista onward into another drawingroom, through the library, would display itself. Were they not so situated, so many doors close together would be objectionable; yet, being placed within a recess, they seem quite independent of the room itself; and are so far from causing any interruption when opened, that the centre door is removed more out of the way than if there were no recess here at all. The door opposite that leading into the drawingroom, by communicating almost directly with the back staircase, yet not so as to expose it, is a great convenience, as it allows of persons who come on business with the master of the house to be shown up, after entering the back way, immediately into the library to him, without passing through the staircase, or being seen by any one. It also affords a direct and private passage to the water-closet adjoining the back stairs; which is also most conveniently situated for ready access from the dining-room likewise, through the private door by the sideboard: an accommodation of some importance, as it would remove all occasion for that of another kind, which is a more useful than elegant appendage to a dining-room. This library, nineteen feet by twenty-four, would be not only agreeably diversified in its form, but also rendered more spacious by the entrance recess and the bay window. This room, however, and the whole house, might be materially improved by an addition to the first plan, viz. a conservatory.

1853. *A Conservatory* would also form a very desirable screen between the garden and the kitchen-court below. This extension of the original limits of the plan is shown in fig. 1597, where it will be seen that the bay of the window is made somewhat deeper than before, in order to obtain sufficient space for a door leading to the conservatory, *a*; and opposite to that is another, opening into a small closet, *b*, for papers, &c. These additional doors, however, would occasion no alteration in the room itself, but leave just as much wall as before for book-shelves. The only other change this alteration would occasion would be, that, instead of folding back, the shutters must be drawn up from a box made to receive them below; which, as there are no windows beneath the bay, would be easily accomplished, and for a mullioned window such shutters would be rather more convenient than not; since, instead of the whole shutters being drawn up before the window, which, owing to the width, would be troublesome, each compartment would have its separate shutter to slide up in a groove in the mullions. By this means each would be securely fixed, beyond the possibility of its being removed, when a bolt was put in it below, to prevent its being pushed down again. In order to give sufficient width to the conservatory, and yet not to bring it so far forward as to seem to shut up the library too much between two buildings, the south-west angle is cut off; which would be rather favourable than otherwise in regard to its elevation; and decidedly so as catching the sun earlier in the day. Should, however, any deviation from the original Design be adopted at all, I would not stop here, but would suggest that a considerable improvement should be effected, by throwing out another bay or oriel towards the kitchen-court, though not so as to look into it; for, although it would have a window, it would be about seven feet or more from the floor; and there would be a book-case under it. The window itself would be of stained and ground glass, thereby occasioning, together with the expanse produced by the oriel itself (which might be raised a single step above the level of the floor, and also carried up higher than the ceiling of the room), a very beautiful effect as viewed from the opposite entrance. The dotted lines at *c*, in the plan, show the situation and extent of this oriel. Should this plan be adopted, the door leading into the conservatory would be made in the oriel, as affording a better entrance than that from the bay; and it might be covered with the backs of sham books, as the side facing it would have book-shelves. The whole room might be rendered more symmetrical and beautiful by making a shallow or blank recess on the chimney side of the room, corresponding with the other three sides, and placing the chimney-piece in it; thus confining the shelves to the spaces entirely on each side of these four arches; and as we have already provided for shutters without having any occasion for them in the bay, there might be shelves in the sides of that also, as well as in the oriel. A still more important improvement here suggests itself to me, which is, to extend this bay, or rather to make it a second but not a separate room, by advancing it as far as the dotted lines, *d*, leaving the arch of the present bay, which would open into a space about thirteen feet by twenty-four. Were the wall, *e e*, removed, not only would all symmetry, and even regularity, be utterly destroyed, but the room itself would appear much too low for its extent; to say nothing of the loss of space for book-shelves against both sides of the piers or walls, *e e*. Neither need we be apprehensive that, owing to this division in the room, and the distance of the window from the fireplace side, the part of the library where this latter is situated would be dark and gloomy, because we have already obtained a spacious window in the oriel. Taken altogether, this apartment would thus be rendered a most delightful one: full of contrast and effect from every point of view; complex, yet full of order; irregular, yet abounding in symmetries. This extension of the library would afford additional accommodation on the floor above, as there might be a chamber over this second or western division of the library, a passage to it being cut off from the other, the window of which must then be placed on the north side. That this is exceedingly practicable, will be instantly seen by referring to the plan of the chamber floor, fig. 1592. With regard to the conservatory itself, while it would be a material recommendation to have it immediately connected with the house, nothing would, certainly, be detracted from the value of its effect, by its appearing externally a separate building, as



1597

there would be no obvious communication between that and the library. Supposing, however, that the whole of the alterations just described should be carried into effect, nothing would then be easier than to make folding doors in the centre of the south end of the conservatory, opening into that angle of the second library; which would certainly afford more direct and convenient access, and a pleasing vista down the conservatory; and as it would be rather an impropriety to place a large doorway quite in a corner, and without any thing to balance it, this objection might be removed at once, by making this door, on the library side, to appear a continuation of the book-cases, and one of their compartments. Nor, in adopting this latter entrance, would it be at all necessary to abandon the other, for the passage from the oriel might also be retained; thereby securing a double effect. The erection of a conservatory in this situation would, besides, be attended with a collateral advantage, which is, that it would enable us to build a laundry and additional offices beneath it towards the kitchen court; whereby the accommodation afforded by the present plan would be greatly increased.

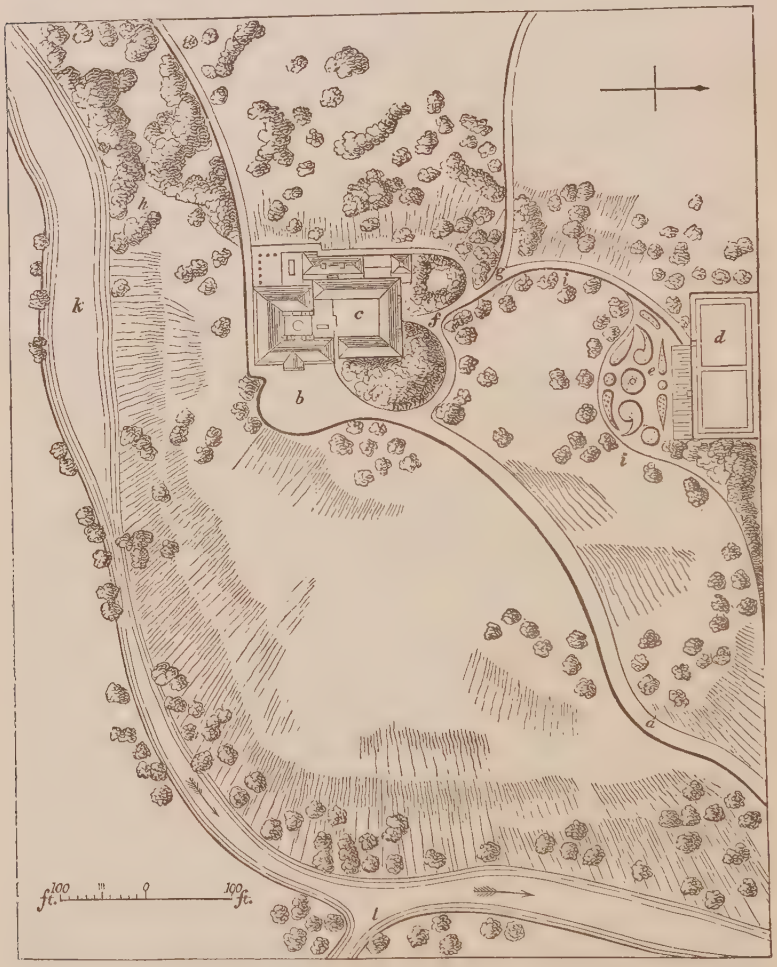
1854. *Concluding Remarks.* When I commenced, it was my intention to make a few remarks relative to the chamber floor, somewhat similar to those on the sitting-rooms; but the latter have extended to such length, that all I can now allow myself is, to make a few remarks as to how far the house, supposing these last-mentioned improvements to have been adopted, would be calculated for effect and display on occasion of a grand entertainment. The first thing that would present itself to the company might be the appearance of a splendid painted window illuminating the vestibule, which piece of decoration would be produced by merely filling the compartments of the screen with small transparencies, with lights behind them. The visiters would then enter the drawingrooms, which, brilliantly lighted up, would lose none of their effect by the contrast they would offer to the subdued splendour of the vestibule; and which would be greatly heightened by the mirrors over the opposite chimney-pieces reflecting the chandeliers into a lengthened vista of tapers. Hence they would turn into the spacious library, where their eye would be caught by the view imaged in the mirror door facing them, and next by the oriel window illuminated from behind. On turning into the second library, the whole length of the conservatory, splendidly lighted, and fitted up as a ball-room, with shrubs and exotics ranged on each side, would present itself through the folding doors. On returning, the company might pass through the passage leading into the oriel, and so regain the library. They would then either re-enter the drawingrooms, or proceed straight forward to the staircase, which would also be lighted up; and have perhaps transparencies in the arches of the upper corridor. Here, too, a splendid effect, of a different character from the rest, would be obtained; for, on directing the eye immediately upwards, would be seen, high over head, a brilliant transparent roof; to produce which, nothing more would be necessary than to have lamps in the space between that and the upper skylight. As the lights behind the transparencies in the screen would destroy all effect here, if visible, they must be concealed by a plain wooden partition lined with tin, both to increase the light, and to prevent accident by fire, for the lamps would be affixed to it; and this partition would in its turn be concealed by draperies nailed up against it. After admiring, or, if not admiring, criticising, the staircase, the company would enter the vestibule, and turn into the dining-room, and the adjoining one, where the supper tables would be laid out; and, having conducted the company to what will hardly be considered an anti-climax, the arrangements of the entertainment, we may now take leave of them. — It is by no means my wish to be understood as recommending the present Design as an express pattern. Upon nearly the same scale, the same accommodation might be arranged in numberless ways; some far more varied and picturesque; all decidedly different from each other; and yet each distinguished by some particular merit of its own. The art of laying out houses or other buildings, by which term I would express something more than merely forming a plan, — something analogous to what is understood by 'laying out grounds,' — that is, planning for effect as well as convenience, is one that admits of unlimited diversity." — W. H. L.

[There may be some difference of opinion as to the merit of the Design itself, but every one, we think, will allow that its author has explained and analysed it in a copious manner, pointing out his aim in all he has done, and assigning reasons in support of it. It is, too, no more than justice towards him, to apprize our readers that, even extended as his description is, some parts have been omitted by us, not because they were either uninteresting in themselves, or irrelevant to the subject, but principally because we had no other alternative than to make such retrenchments, or exclude his paper altogether, in consequence of the space it would have occupied. Still, abridged as it is, it may serve as a model for the explanatory text that should accompany published designs; and it is probable, that, were Architects to consider what they should say of them, they would frequently bestow more study and consideration upon the designs themselves.]

Design XIX. — *A Villa in the Grecian Style, for a large Family, residing chiefly in the Country, with an Income of from £6000 to £10,000 a Year.*

1855. *The Situation* of this villa is on the high and steep bank of a river in Devonshire, where it was built, a few years ago, from the designs and under the direction of Charles Vokins, Esq., Architect, Pimlico. Fig. 1598 shows the relative situation of the house,

1598



offices, and garden; *a* is the approach; *b*, the entrance front of the house; *c*, the stable and kitchen court; *d*, the kitchen-garden; *e*, the flower-garden; *f*, the family entrance, and road to the gardens; *g*, drive to the wooded hills behind the house; and *h*, iron fence separating the lawn from the woods. This lawn is not mown, but pastured by sheep and deer, which are also kept from the plantations between the house and the kitchen and flower gardens by a similar iron fence, in the direction indicated by the letters *i i*; *k* is a river; and *l*, a stream which joins it; the point of the junction is about 200 feet below the level of the floor of the house. The grounds behind are wooded, and rise to hills to the height of several hundred feet. The general appearance of the house, as seen within 300 feet of the entrance front, is as shown in fig. 1599.

1856. *Accommodation.* In the ground plan, fig. 1600, *a* is the entrance hall; *b*, the library; *c*, drawingroom; *d*, dining-room; *e*, great staircase; *f*, breakfast-room; *g*, bed-

1599

room for an elderly person; *h*, dressing-room; *i*, water-closet; *k*, stairs ascending to the bed-rooms, and descending to the cellars; *l*, closet for great-coats, &c.; *m*, business-

room, or study; *n*, fire-proof closet adjoining; *o*, fire-proof staircase; *p*, steward's room, *q*, back entrance for the children and family; *r*, billiard-room, lighted by a lantern above, with a stained-glass window at one end; *s*, water-closet; *t*, butler's room; *u*, strong

closet for plate; *v*, housekeeper's room; *w*, kitchen; *x*, scullery; *y*, wet larder; *z*, vegetable larder; *&*, dry larder; *a'*, game larder; *b'*, servants' hall; *c'*, cleaning and dressing room for men-servants; *d'*, servants' entrance from the yard; *e'* and *f'*, coal-cellars; *g'* and *h'*, beer-cellars; *i'*, brewhouse and bakehouse; *k'*, open yard; *l'*, maid-servants' privies; *m'*, privies for stable-men, &c.; *n'*, four-stalled riding-horse stable; *o'*, loose box for a sick horse; *p'*, harness-room; *q'*, coach-house; *r'*, entrance to stable-yard; *s'*, coach-house; *t'*, harness-room; *u'*, loose boxes for sick horses; *v'*, hay-room; *w'*, clock-house; *x'*, corn-room; *y'*, coach-horses' stable; *z'*, double coach-house; *&'*, stable-yard; *aa*, private entrance from the lawn; *bb*, space for conservatory. The apartments, *g*, *h*, and *i*, are shut in by a door at *k*, and may form a suitable bed-room, dressing-room, and water-closet for an infirm person, unable to go up stairs. The business-room, *m*, commands a view of the yard. The gentlemen's water-closet, *s*, is situated near the billiard-room and dining-room. The large vegetable larder, *z*, is only roofed to the line of columns, and the outer half is left open as a yard. The ground is high opposite the coal-cellars, *e* and *f*, and the coals are let down, in the usual way, by an opening in the roof. The malt and hops are delivered into a gallery in the brewhouse, from the same elevated ground. On entering the hall, *a*, a vista presents itself, 300 feet in length, extending through the billiard-room, *r*, and terminating in a beautiful stained-glass window at its farther end. The billiard-table is fixed, altogether independently of the floor, in the following manner: — Stone piers, two feet square, are carried up from the foundation, which is here a freestone rock, directly under the position of each foot of the table. The piers are terminated by cones of stone, whose bases cover the area of the piers, and whose summits are truncated, the diameter of the section being four inches, or about half an inch more than that of the feet of the table. The height of the upper surface of these cones is on an exact level with the intended floor of the room; and this floor is not put down till the billiard-table is set and levelled. This being done, the floor is put down altogether independently of the cones; the object being to prevent the possibility of communicating the slightest motion to the billiard-table, by the players or others walking round it, while the game is going forward. The billiard-table is lighted during the day by a lantern skylight (a skylight with upright sides, glazed, and an opaque cover), of the exact size of the table, twelve feet by six feet, and directly over it; and in the evenings there is a lamp suspended from the centre of the roof of the lantern. The roof of the billiard-room is flat, and forms a flower balcony to the dressing-room of the lady of the house. The entrance hall, finished with niches, and lighted by a glass dome, has a very handsome effect.

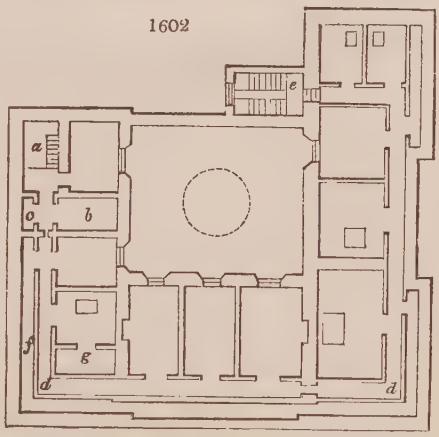
1857. *The Chamber Floor*, fig. 1601, shows, *a*, great staircase; *b*, best spare bed-

1601

room; *c*, dressing-room; *d*, spare bed-room; *e*, dressing-room; *f*, bed-room; *g*, spare bed-room; *h*, dressing-room; *i*, water-closets; *k*, back staircase for company's servants; *l*, family bed-room; *m*, ladies' dressing-room, with an outlet to the flat roof over the billiard-room; *n*, passage; *o*, bed-room, or dressing-room; *p*, fire-proof staircase; *q*, stairs leading to the nurseries; *r* and *s*, housemaids' closets, supplied with hot and cold water, wood, and coals; *t*, water-closet; *u*, light to lower water-closet; *v*, bed-room; *w*, governess's room; *x*, upper part of kitchen; *y*, *z*, and *&*, sleeping-nurseries; *a'*, day nursery; *b'*, plunge bath. Each of the spare bed-rooms is shut in by a door, having a dressing-room and water-closet to each. The family part of the house is quite distinct from the visiters' apartments, and has no communication with them but by the passage, *n*.

1858. *The Attic Floor*, fig. 1602, contains, *a*, fire-proof staircase; *b*, room containing a furnace and boiler for heating water to supply all the bed-rooms in the floor below; *c*, closet; *d*, passage to the bed-rooms; *e*, stair for company's servants; *f*, concealed passage for bell wires, &c. The other apartments, eleven in number, except the closet *g*, are bed-rooms. All the bell wires rise perpendicularly in tubes from the different rooms, to the concealed passage, *f*, and descend in one tube or trunk to the bells, which are hung in the passage, *l*, in the plan of the principal floor, fig. 1600. The boiler, *b*, supplies the whole of the house with hot water.

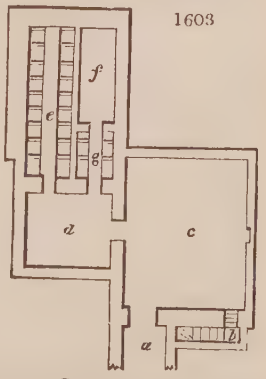
1602



The Basement Floor, fig. 1603, contains an inclined plane, *a*, for sliding down pipes of wine; *b*, cellar stairs; *c*, large cellar for hot-air stove to heat the whole house; *d*, cellar for wine in wood; *e*, large wine-cellar; *f*, store-cellar; and *g*, butler's wine-cellar.

1859. *Construction.* The walls are built of freestone, from a quarry on the spot (indeed, partly taken out of the foundations of the house), and internally they are lined with brick. All the partition walls are of brick, and, for the most part, are nine inches in thickness, except those in the attic story, which are of brick nogging. There is not a single lath and plaster partition in the house; in consequence of which, the danger from fire, if it should break out in any part, is greatly diminished. The roofs over the billiard-room, over the staircase, over the smaller buildings between the staircase and the court, and over the passage leading to the nursery, *z*, are flat, as may be seen in the vertical profile of them shown in the general plan, fig. 1598.

1603



1860. *General Estimate.* The cost of this building, in a country where freestone is abundant, and easily worked, would not exceed £10.000; but in the neighbourhood of London, if it were built with brick and covered with cement, the amount would not be less than £20,000. The cubic contents are 460,464 feet; which gives about 5½*d.* per foot for the country, and about 11*d.* for the neighbourhood of London.

1861. *Remarks.* This Design, in point of style, affords a very good specimen of a Grecian villa, in what may be called pure architectural taste, with the chimney tops entirely concealed. This concealment of the chimney tops has almost always been aimed at by Architects, when the object in view was what is called the pure Grecian; and certainly the absence of chimneys is favourable to the expression of the temple-like style of Architecture, which is characterised by porticoes, pediments, and low-pitched roofs. Mr. Joseph Wood, for whose taste in Architecture we have the highest respect, and with whom we agree in almost every thing, has given a sketch of a Grecian villa, to illustrate his *Essay on Villas*, published in the first volume of the *Essays of the London Architectural Society*. We have copied a part of this sketch, fig. 1604, for the sake of showing

1604

that chimney tops form no part of Mr. Wood's idea of a Grecian villa. It would, however, be difficult to construct such a villa as is indicated by this vignette in such a manner as to have open fire-places in the apartments, and yet to be without the appearance of chimneys externally. In the case of Mr. Vokins's villa, this is much more easily done, because the high parapet affords an opportunity of concealing such of the chimney tops as may be in the outside walls; and those in the cross walls, and in the interior walls need not be carried higher than the ridge of the roof, by which means, and by drawing the flues to the inner slope of the roof, none of the shafts will appear on the outer slopes of the roof, and consequently none be seen in the elevation. Notwithstanding the facility of concealing the chimneys in the Design before us, we should, for our own particular taste, have greatly preferred them displayed, for the sake of giving the building the expression of a dwelling-house. Looking at the edifice as it is, and without reference to surrounding scenery, it is not easy to determine whether it is a private house or a public institution. The true principle of imitating Grecian Architecture in a villa, in our opinion, is, not to produce a building, like that of Mr. Wood's villa, without chimney tops, which might be mistaken for a temple, or a combination of temples; for that would be mere mimicry; nor, like the Design before us, a house without chimney tops, because that gives false expression, or, at all events, is defective in that quality; but to imitate the style and manner of Grecian composition, and adapt it to the particular purpose in view. Mr. Vokins's Design wants only chimney tops to make it come up to this idea, and, indeed, the same may be said of the villa of Mr. Wood. The same principle will apply to the imitation of any of the varieties of Gothic Architecture. Indeed, the young Architect may always bear it in mind, as a fundamental principle, that all facsimile imitation ranks no higher than mimicry; and that imitation, to belong to elegant art, must be the imitation of spirit and manner, not of individual forms. — With respect to the interior arrangement of Mr. Vokins's Design, it is admirable. The cubical mass of the main body of the building admits of getting a great deal in little space, and with much less expense of walling than if the general form had been a parallelogram. The manner of setting the billiard-table (§ 1856) is worthy of notice; and also the mode in which hot water is supplied to all the bed-rooms, and to the nursery in the chamber floor, from a boiler in the attics over it. The concealed passage for the bell wires in the attic floor, and the trunk for their descent, are also judicious contrivances; and we may state here, that all the pipes from the roof, and from the water-closets, as well as all the pipes connected with cisterns, and the cisterns themselves, are so placed and protected as never to be liable to be frozen. In short, the interior arrangements of this house are among the most commodious and complete that we have seen, and Mr. Vokins has introduced some ingenious inventions in the internal finishings and fittings-up, which will be found in the chapter which will hereafter be given on those subjects. We cannot say much in favour of the laying out of the grounds. It is evident that the best views must be obtained before entering the house, which is at variance with one of the fundamental principles of landscape-gardening. (See *Gard. Mag.*, vol. ix. p. 3.) The flower-garden is separated from the house in such a manner that a back road has to be crossed in walking to it, which is also in bad taste.

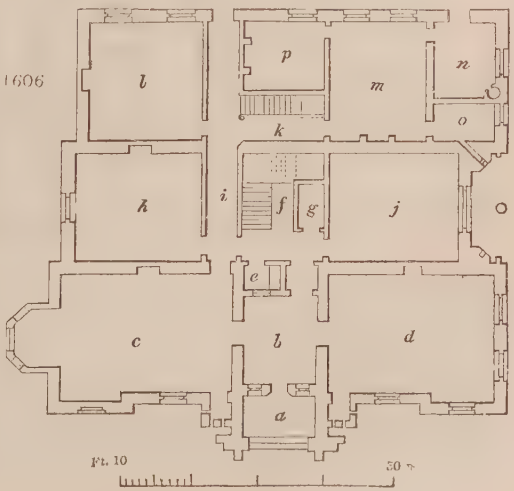
Design XX. — *A Villa for a small Family, in the Castellated Style of Gothic Architecture.*

1862. *The Situation* for a villa, in this style, according to general associations, should be on a bold commanding rocky prominence, where it might be supposed that, in some former period, a baronial castle for actual defence may have been placed. It is not necessary on that account, however, that it should be accompanied by fortified outworks; but still the terrace-walls, and other ornamental architectural appendages which accompany it, should either be in some degree marked by the lines and finish of fortified walls, or should imitate their ruins. Even, in point of architectural harmony, the crests (tops) of such walls should be more or less embattled, like the parapets of the house. A slight degree of acquaintance with Military Architecture, or with the existing ruins of castles of the fourteenth century still to be found in Britain, or on the continent of Europe, will afford many excellent hints for designing the external Architecture of the main body, and especially of the appendages, of buildings in this style. For the arrangement of the interior, recourse must be had to the wants of modern society; for, as we have said before, the object, in cases of this sort, is never to mimic individual examples, but to imitate the general spirit of the style and manner. Fig. 1605 is a perspective view of the Design before us.

1605

1863. *Accommodation.* Fig. 1606, is the plan of the principal floor; in which *a* is the entrance porch; *b*, the hall; *c*, the dining-room; and, *d*, the drawingroom; each of which has a light closet attached to it; *e*, water-closet; *f*, staircase; *g*, coat-closet; *h*, butler's room; *i*, passage; *j*, library; *k*, back staircase; *l*, servants' hall; *m*, kitchen; *n*, scullery; *o*, pantry; and, *p*, housekeeper's room. Above the dining-room are a bed-room and dressing-room, and there are similar apartments above the drawingroom, hall, and porch. Above the other rooms, the arrangement of the bed-rooms and dressing-rooms is obvious. Above the servants' hall and pantry are sleeping and day nurseries; and in the attic story are the servants' apartments, and bed-rooms for single gentlemen.

1606



1864. *Construction.* The walls may be of brick, or of stone lined with brick; all the partitions on the principal floor should be of nine-inch brickwork, and all those on the chamber-floor of 4-inch brickwork. The partitions in the attic story should be of brick nogging. The two staircases ought to be of stone, or the principal staircase may be of solid stone and the back staircase of cast-iron framing; the risers of grating, and the treads of flagstone. Even the principal staircase may be formed in this manner, the effect of which is very elegant, and which, sometimes, is useful in affording light to the stairs below. The roof may be flat, covered with plain tiles bedded in cement, and coated over with three thin layers of the Stanhope composition, described § 1789. The flooring of all the rooms may be of Wright's ornamental tiles. The battlements may either be finished in stone, which is the preferable mode; in brick, covered with cement, and coloured in imitation of stone; or in brick alone; those for the copings and mouldings being moulded of suitable shapes before being burnt. This practice, as we have already observed, § 274, is as old as the time of Henry VIII., and the bricks produced are almost as durable as stone. The richest Gothic building in England, the house of the late Countess of Stafford, at Jerningham, near Norwich, designed by J. Buckler, Esq., Jun., has all the principal ornaments of the chimney tops and mouldings executed in brick made on the spot.

1865. *General Estimate.* The cubic contents are 138,422 feet; which, at 6*d.* per foot, is £3,460 : 11*s.*

1866. *Remarks.* The internal arrangement of this Design is excellent, and, from the compact, cubical form of the building the expense must necessarily be moderate in proportion to the accommodation afforded. Corbeled, or far-projecting cornices, like those here shown, were only used in ancient times, when castles were built for defence. The parapet being thus projected from the wall, and openings being left between the stones, missiles of different kinds could be thrown down on the assailants. Such edifices were never placed but in situations that afforded some natural means of defence; such as eminences, prominences projecting into lakes or the sea, or rocky steeps. Hence, to build such a castle in a tame flat situation would be improper, because the illusion would not be kept up. For this Design we are indebted to the author of the preceding one.

Design XXI. — *A Villa in the latest Style of Pointed Architecture, with an Essay on the Application of that Style to domestic Purposes.*

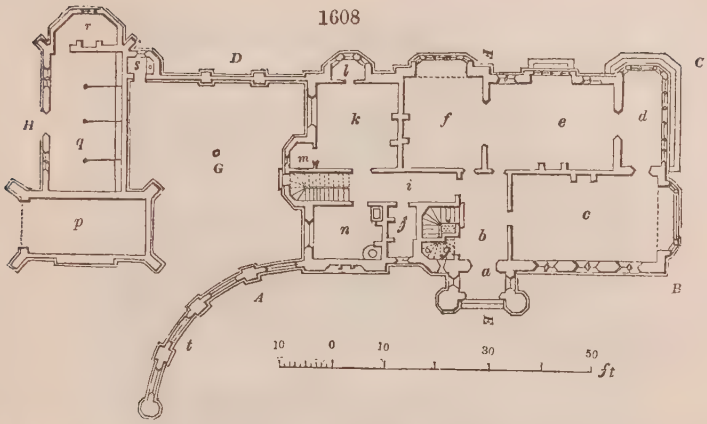
1867. *This Design,* of which fig. 1607 is a small perspective view, has been contributed, together with the essay that accompanies it, by E. Trotman, Esq., a young

1607

Architect, who bids fair to rise to the very summit of his profession. We consider it unnecessary to say any thing on the architectural beauty of the elevations of this Design, because it must strike the eye of every reader; but we must request the careful perusal of the essay, which we do not hesitate to affirm that we consider one of the best which has hitherto been published on the subject of which it treats.

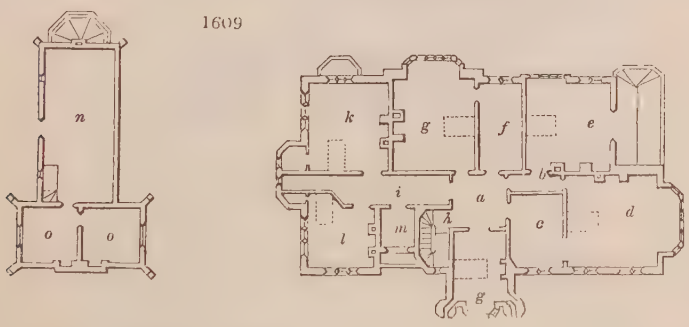
1868. *Accommodation.* In the ground plan, fig. 1608, *a* indicates the porch; *b*, the hall, sixteen feet by ten feet, lighted by sash-doors, as expressed in the elevation; *c*, dining-room, twenty-eight feet by sixteen feet, and fifteen feet high, to which the old appendage of the oriel window is attached, though with some difference of character and position; *d*, conservatory, eighteen feet by eight feet, which may communicate or not

1608



with the former by the doorway shown; *e*, drawingroom, twenty-five feet by sixteen feet; *f*, library, seventeen feet by fifteen feet, which, being arranged *en suite* with *e* and *d*, may command a pleasing view, if the vista be increased by a large chimney-glass; *g*, water-closet; *h*, principal staircase; *i*, passage, cut off from the hall by a door, and leading to the back staircase and offices; *j*, butler's room; *k*, kitchen, with pantry or larder, *l*, and large closet, *m*; *n*, scullery; *o*, the kitchen court; *p*, coach-house; *q*, a four-stalled stable; *r*, harness-room; *s*, servants' water-closet; and *t*, an ornamental screen and fence wall, to conceal the kitchen court. Ample cellarage for coals, wine, beer, &c., may be obtained in the basement. On the chamber floor, fig. 1609, *a* designates the landing

1609



of the staircase, lighted by a skylight; *b*, passage to the chambers; *c* and *f*, dressing-rooms; *d*, *e*, *g*, *g*, bed-chambers; *h*, staircase continued up to an additional room on the second story, over the porch; *i*, passage to the servants' apartments, *k* and *l*; and *m*, store or linen-room; *n* is the hay-loft over the stable; and *o o*, the coachman's living and sleeping-rooms.

1869. *Construction and Architectural Character.* Fig. 1610 is an elevation of the entrance front.

Fig. 1611. Elevation of the garden front.

Fig. 1612. End view from the stable court.

Fig. 1613. Elevation of the stable and coach-house.

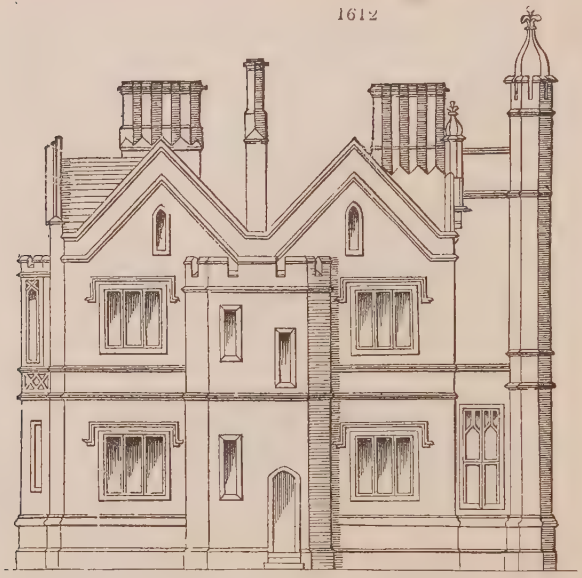
Fig. 1614. Section through the house on the line A B.

This Design (which is composed in the latest style of Pointed Architecture) might be executed with propriety and effect in brickwork; with the dressings, or ornamental parts in stone. Lead lights in quarry (or lozenge) squares would have by far the most characteristic appearance for the windows; but in this matter considerable latitude may be allowed. The ornamental members throughout have as much simplicity as is consistent with the character of the masses and of the style; and a design of this kind, if correct in its simpler state, may easily be enriched at pleasure by the use of tracery, foliage, grotesques, &c.; care being taken to equalise the decorations of all parts which

Elevation of the Entrance Front of Mr. Trotman's Villa.

Elevation of the Garden Front of Mr. Trotman's Villa.

1612

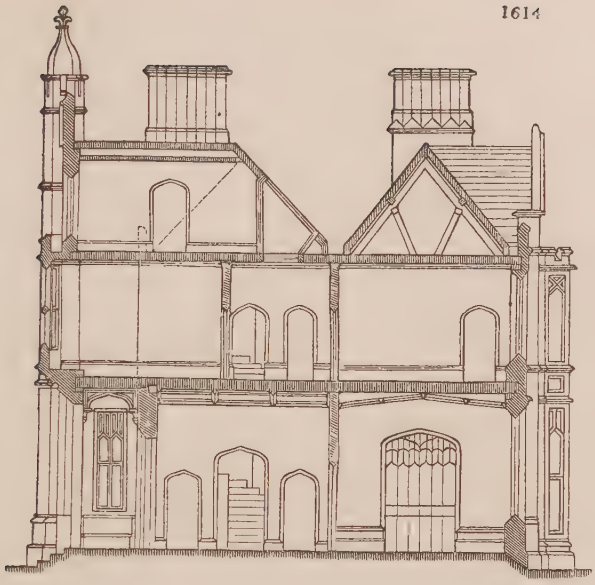


may be exposed to the eye at the same time. It must, however, be confessed that to do this with propriety is, in common with the treatment of Pointed Architecture in general, a matter of great hazard to the mere amateur.

1613

1870. *General Estimate.* The cubical contents of the house itself will average 117,713 feet; which, at 10*d.* a foot, amounts to £4904 : 14*s.* : 2*d.* Those of all the outbuildings, together, are 24,645 cubic feet, which, at 9*d.* a foot, is £924 : 3*s.* . 9*d.*, making the whole expense £5828 : 17*s.* : 11*d.*

1871. *The preceding Design* illustrates an attempt at the composition of a villa in the latest style in which Pointed or Gothic Architecture existed in its purity. It has not, indeed, been our object here to present to the eye an elaborate and costly display of all the domestic resources of Tudor magnificence, or to please the fancy of the staunch antiquary with the representation of a quadrangular pile, rigidly fashioned after the models of the year 1500; but to offer to the man of moderate fortune, and Old English taste, a Design which may be characterised by convenience, architectural propriety, picturesque effect, and simplicity of decoration, while it possesses the essential recommendation of being within the limits of economy in the execution. Its general character and various accommodation will, it is hoped, be sufficiently comprehended upon a comparison of the drawings with their references. The understanding, however, of its constituent parts,



as a composition, will perhaps be most effectually promoted by the introduction in this place of some observations upon Pointed Architecture in general (for, on the ground of correctness and significancy, the term "Pointed," is far preferable to the nickname of "Gothic"), and more especially as applicable to the principal subjects of which this work professes to treat.

1872. *The claims which Pointed Architecture has upon the favour of an Englishman* are indeed of a supreme and unrivalled order. It was in England that that style, the last and finest of the great general systems of human taste, found a congenial home, and displayed its most luxuriant beauties, as well as much of its most impressive grandeur. It was here that, in its progressive growth and developement, it exhibited its happy adaptation to the wants of the people, the exigencies of the climate, and the diversities of circumstances; and it was on this land that it threw the last lingering beams of its effulgence, which still struggled amidst the gathering darkness, until overpowered by the night of blind affectation and lawless extravagance. Happily, however, for the interests of sound taste, our country, after having given trial, for nearly three centuries, to the merits of what was called Classic Architecture, both the true and the false, has begun to discern that the native style, so long neglected, has claims to admiration which the pretensions of foreign art can never eclipse or invalidate. Accordingly, our own nation has been the most forward to compensate for its past indifference, by exhibiting, of late years, the efforts of a laudable zeal in the preservation and restoration of some of the most interesting remains of antiquity; and, if we cannot profess any admiration for the great mass of what are called "Modern Gothic" compositions, we must, at the same time, confess, that the fact of their existence demonstrates, at least, a favourable direction of the public mind, and affords a hope that future attempts will assume a far more successful character. Indeed the daily increased extension of general knowledge involves the overthrow of false principles and unreasonable prejudices in art; and, when to the removal of these is added a comprehensive acquaintance with the resources and characteristic spirit of a system of such richness and amplitude as that of Pointed Architecture, we shall be relieved from all fear lest that style should be undervalued, and shall suffer no apprehension for the purity of the new specimens therein, or the security of the old. We are not sanguine enough to expect that Pointed Architecture should again become as fashionable among us as it formerly was, when it imparted a character even to the hovels of the poor; nor, indeed, are we disposed, upon the whole, to wish that it should be so; for, in these times of increased population, of extended building, and of freedom of opinion in matters of taste, we should fear that, under the best practicable state of public culture, the propagation of deformity, and of the gingerbread style of art, would be far more rapid than that of the chaste and the beautiful. At the same time, it is our

anxious hope, that, in those works over which enlightened individuals or collective bodies are the arbiters of taste, and in which, from their locality and destination, the adoption of such a style would be appropriate, the mode of Architecture under consideration may receive a yet greater measure of patronage than it has hitherto obtained, accompanied, however, with a more vigilant degree of scrutiny. That it deserves such favourable yet watchful patronage, a few remarks, we think, will suffice to prove.

1873. *As an ornamental Science, the Merits of Pointed Architecture are of the highest order*, arising from a combination and consummation of excellencies, which earlier styles exhibited only in an imperfect degree. The classical structures of Greece affected the beautiful and the simple; those of Rome the bold and the picturesque. The former could not have attained the masculine force and variety of the latter without the sacrifice of their distinctive character; nor, without a correspondent loss, could the latter have assumed the feminine grace and detailed beauty of feature peculiar to the former. In the maturity, however, of Pointed Architecture we see this happy union of properties completely effected. The contour of its masses displays the very essence of the picturesque; the prevailing lines of composition, the aspiring and the curved, unite dignity with grace; while the ornamental detail exhibits the most gratifying alternations of light and shade, and often the most luxuriant richness of a playful imagination. Nor is this all, as applicable to the style in general; for, in its adaptation to particular purposes, its universal power is ever discernible. Thus, in York Cathedral it becomes solemnly grand; in King's College Chapel, Cambridge, it mingles in equal proportion beauty with grandeur; in Henry the Seventh's Chapel it assumes an aspect of dazzling richness; in Windsor Castle it rises bold and lordly; in the colleges of our universities it unites the domestic with the ecclesiastical; and, in passing thence down to the simple forms of the humblest cottage, it varies its character according to circumstances; being no less consistent and successful in the last than in the first. Great as are thus its powers, and varied as are its resources, independently considered, the merits of Pointed Architecture are highly enhanced by the aptitude with which its productions harmonise with the scenery and atmospherical effects of nature. How happily, as contrasted with the square masses of Classic Architecture, do the towers, the turrets, the pinnacles, the gables, the battlements, and the chimneys of the pointed style mingle with the sylvan objects of the painter's study! Observe these, gilded by the warm beams of the setting sun, or standing in strong relief against a moonlit sky, and say where is the Greek or more picturesque Italian structure that can hazard a comparison with them. The terminating lines of the latter styles are almost always of a hard and square character, setting art in marked opposition to nature; those of the former are ever of a varied form and aspiring tendency, mingling with all the objects of landscape aerial and terrene.

1874. *Suitableness of Pointed Architecture for interior Composition.* In addition to these last observations, which affect Pointed Architecture in its external developement, we may remark, that, for success in internal composition, no other style can for a moment compete with it. This success is of course exhibited, to its full extent, only in ecclesiastical interiors. In introducing a comparison between these in the pointed style, and ecclesiastical interiors in other modes of art, we must be distinctly understood as confining our notice exclusively to those features which come within the province of Architecture. In buildings, however, of domestic application, and with which we are in this place more immediately concerned, no limits can be assigned to the display of the impressive or the ornamental; and, indeed, with this class of Architecture, the ecclesiastical is not unfrequently associated, as in the instance of domestic chapels. Few, confessedly, are the apartments of modern construction that can claim a dignified beauty, equal to that possessed by the halls and galleries of many of our old domestic and collegiate edifices; yet it would be frivolous to assert that even those venerable specimens had obtained an unapproachable degree of splendour, or had exhausted the resources of the art.

1875. *The Perpendicular Pointed Style.* There is one further consideration worthy of notice in favour of the style before us, ornamentally regarded, and it is this, that the perpendicular pointed mode of Architecture, of which we shall have occasion hereafter to speak more fully, and which is the only genus of the style capable of application to modern domestic purposes, is *exclusively English*. The finest Continental remains belong to what we shall denominate the middle period of the art; it is to a later and more finished class that we now refer, in which an Englishman will be proud to rank many of the brightest architectural gems of his country, with King's College chapel at their head. That this mode has therefore a strong claim upon the national attention and favour, appears to us a reasonable inference; our only hope is, that that favour may be attended with an enlightened vigilance, in order that modern productions may be rendered in some degree worthy of their antique and admirable exemplars. There are, however, other considerations of weight on the side of Pointed Architecture, as founded on its

adaptation to the exigencies of our climate, and to the purposes of convenience. Thus, in the former case, we have, instead of the gently sloped coverings of southern climes, the high roof, with its picturesque concomitant the high gable, in order the more effectually to throw off the rain and snow of our less hospitable region. To obtain more, also, of the light of day than was needed in the Greek or Roman structure, we have windows of ample dimension, while of firm construction. To enjoy the benefit of the Greek peristyle for walking in shelter, we may have the yet more closely sheltered cloister. To screen our entrances, we are provided at pleasure with the porch; and, to protect our less substantially constructed walls, we are allowed to finish our roofs with projecting eaves and ornamental verge-boards. The ample fireplace and picturesque chimney-stack are features suited to our climate, of which ancient classic remains afford no example. Nor must we forget to notice the facility with which, in Domestic Architecture, the Old English style accommodates itself to the opportunities, and means of building, prescribed by diversified circumstance and locality. Thus, let freestone, brick, flint, or timber be the prevailing material of construction in any given district, it will suit itself to either, and assume alike a picturesque and interesting aspect in all. A further advantage connected with the use of this mode, on the ground of convenience, is the aptitude with which it admits of additions and alterations. Its rules of composition are not fettered by that strict regard to uniformity which is displayed in works of Greek or Italian origin: such a principle would tend at once to destroy the varied interest which constitutes so powerful a charm in the works of that class for which we plead. Hence it is that those alterations and additions to any given Design, which in other styles occasion deformity, become in this, if judiciously treated, the means of improving the character of the primitive pile, by diversifying its outline, varying its light and shade, or enhancing, by contrast, the importance of the principal masses.

1876. *Comparative Expense of Buildings in the Pointed Style.* If, then, it be admitted, from the observations already offered, that the considerations of architectural beauty, fitness, and convenience, as well as those of association, are in favour of the Old English or pointed style, let us enquire how the question stands with regard to expenditure. And here we must candidly allow, at the outset, that, if it be asked whether Pointed Architecture, when simplified to its utmost extent, is as economical as our ordinary kind of domestic construction, when that is in like manner simplified, we are compelled to reply in the negative. For, indeed, to put the question in this form, is to ask whether that which is of a genuine architectural character can be executed for as little cost as that which makes no claim to character whatever. If, however, the comparison be formed, as it should be, between a building in the Old English mode, and one of equal pretension in either of the classic styles, we are fully prepared to maintain that the former will, in judicious hands, be as economical as the latter; and in this opinion we shall be supported by a reference to the comparative cost of various works of recent date, more especially churches. The great secret of cheapness in this style is to know how far ornament is essential; where it may be introduced with the greatest expression and character; and how its place may be most effectually supplied by force of outline and of shadow. There cannot be a more gross error in art, than that of supposing that elaborate ornament is essential to real beauty; or, on the other hand, that the application of such ornament can render correct that which is not consistent and spirited when reduced to its very first elements. It is to the neglect of this fundamental principle that we attribute the existence of heaps upon heaps of contemptible trash called Gothic, not only in the way of metal-work, furniture, and the like, but even of Architecture itself. Let the character and application of primitive forms, both in the mass and in the detail, be well understood, and the pointed system may then fairly challenge a comparison with all other modes, as well on the ground of economy as on that of taste itself.

1877. *Causes of the Neglect of the Pointed Style in Villa Architecture.* Such, then, being the recommendatory qualities of the style under consideration, it may be natural to ask whence it arises that our own national department of art has, till lately, so completely yielded to systems of foreign origin. This, we imagine, may be accounted for upon various suppositions. Of these, the first is, that, under the increased pursuit of classic literature in the reigns of Henry VIII. and Elizabeth, our ancestors affected a correspondent admiration of classic art; an admiration increased by the charm of novelty, and, for a while, of exclusiveness. While, too, the more polished men of the time thus cultivated their newly acquired taste, it is reasonable to suppose that the progress of the principles of the Reformation would have a tendency to excite in the minds of the people an indifference to that mode of Architecture which they had been accustomed to regard as associated with the observances of Popish superstition. The Italian style, then, being once established in the land, even with such an intermixture of crudities and rudeness, it was natural to expect that, as its merits (great as they unquestionably are) became more fully developed, they would be but the more steadfastly supported, especially as

Architecture began now to be studied as an independent profession. The practitioners of that time, too, like many of our own, found it a much easier thing to fall in with the fixed and mechanical rules of Italian composition, than to venture on a species of design for which there are no such absolute laws; and which, on the other hand, demands of the Architect the exercise of a vigorous fancy, in connection with patient and extensive study; placing the great test of excellence in the correctness and depth of feeling by which he is influenced. Besides this, we may remark that the Italian style, by the period at which it had attained any thing like purity in this country, had so accommodated itself to, and identified itself with, the conveniences which the now daily increasing refinement of the times demanded, that it threw a shade over the old system, which had no precedents to offer for the architectural contrivances of a more luxurious age. Not, indeed, that there then were, or even now are, any of the conveniences of domestic construction to which Pointed Architecture is essentially incapable of application; but that the artists of the times were more willing to improve upon examples of such features already numerous and suited to their own taste, than to exercise their judgment and feeling in the task of adapting an obsolete style of building to new and unprecedented purposes. Indeed, even in our own day, it is to be apprehended that the pointed style may have been depreciated, on account of a supposed intractability of character; when, in truth, the fault attaches, not to the style itself, but to the precipitancy of those who reject it, without having studiously endeavoured to become acquainted with its resources. We will not, however, deny that there are some essential characteristics in the adaptation of this class of Architecture to ordinary purposes, which are calculated, at first sight, to place considerable difficulty in the way of the practitioner; and of which the two following may be regarded as the chief, being, at the same time, matters fundamentally opposed to the procedure of the classic styles.

1878. *Difficulties in the Pointed Style.* One of the characteristics of the pointed mode is, that, for the maintenance of strict consistency, no mass of material should ever receive its apparent support from a horizontal bearer, but always from the intervention of an arch; the other is, that, in the details of this style, decoration is obtained rather by a cutting-out of the solid than by an application of mouldings to the surface. The former of these principles entirely forbids the use of a square-headed door, a square-shaped chimney-piece, or a straight beam on columns; and scarcely even admits of the adoption of a flat ceiling: the latter altogether rejects decorations so easy of attainment as those of pilasters, fascias, and architraves, knowing only the embellishments of moulded jambs and reveals, solid mullions, tracery sunk into the substance of its material, and the like. These matters are, however, difficulties only in the way of the learner; the judicious practitioner will find it easy to turn them to the most advantageous account, while he discerns in them a test for the skill and feeling of competitors around him.

1879. *The Progress and the Characteristics of Pointed Architecture in general, from the Time of its Rise down to that of its Disuse,* next demand our attention; and, where the nature of the subject will permit, our remarks will tend chiefly to the illustration of Domestic Architecture. This latter application, however, we shall not be able to effect with any success, in reviewing the more remote history of the pointed style, which we shall, therefore, notice only for the sake of displaying to the reader the connection which subsists between the earlier and later varieties of the art; and the increase in refinement and beauty by which those varieties are progressively characterised. The limited extent of our information on the subject of domestic construction, so far back as the thirteenth century, or, perhaps, we should rather say, the non-existence in that age of what might be considered fair specimens of Domestic Architecture (in the sense in which we ordinarily understand the term), will compel us to illustrate our remarks upon the earlier modes by a reference to ecclesiastical remains. Indeed, the ideas of our ancestors, as exemplified in the construction of those domestic structures which have been transmitted to our own times, were so obviously formed upon the models of ecclesiastical works, subject to reasonable modifications, that we shall find an investigation of the latter the means of introducing us to a comprehensive knowledge of the former. It is not, however, our intention to make this the place for a disquisition upon Sacred Architecture; or, indeed, to notice it to any greater extent than may be absolutely requisite for the elucidation of the pointed style in general, and, eventually, of Domestic Architecture in particular.

1880. *Origin of the Pointed Style.* It would be of little benefit or interest to the general reader, to enter into a review of the various opinions that have been entertained upon the obscure subject of the origin of the pointed arch. To say nothing of the influence of capricious fancy, which might have suggested the trial of so novel a device, we think the only two hypotheses to which any plausibility whatever can attach are, that the pointed arch was either introduced from the East, after the expedition to the Holy Land under Richard I., or that it was a feature suggested by the forms arising from

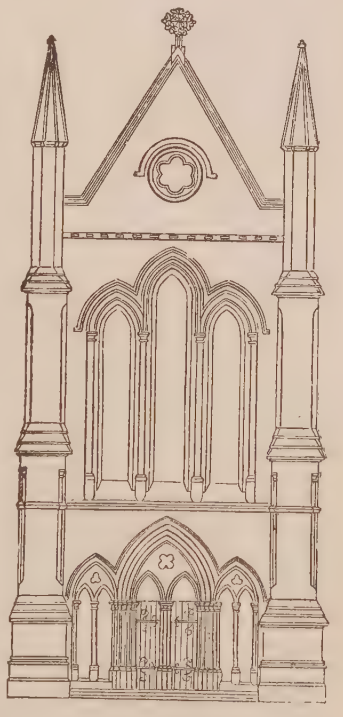
the intersection of semicircular arches, as perpetually instanced in ornamental works of the Anglo-Norman period, fig. 1615. Be that as it may, a considerable time intervened between the crusade in question and the appearance, in this country, of any thing which may be denominated Pointed Architecture; and, when the adoption of that style to any extent took place, the form of arch universally prevailing was that resulting (according to the second supposition) from curves described from the extremities of the base of an equilateral triangle; and did not exhibit that latitude of figure observable in the Oriental specimens.

1615

1881. *Pointed Architecture assumed the Character of a System* at the beginning of the reign of Henry III.; the commencement of that reign being dated from the year 1216. Its progress from the first was rapid; and, accordingly, it had been so extensively adopted, and so assiduously cultivated, by the middle of the same century, as to have attained all those decided characteristics which we shall consider indicative of the first of the three great denominations under which we shall, in our present remarks, classify the varieties of the system in general.

1882. *Of the Early Pointed Style* (for so we designate the species of this kind of Architecture now referred to) we have endeavoured to exhibit the most prominent features in the accompanying sketch, fig. 1616. These features are, the high roof and gable; the single or (as it is here represented) the triple lancet window; the simply bold doorway, frequently divided, as here shown, by a central column or cluster, and headed (as, indeed, are the blank compartments on each side, and the divisions of the window above) by an arch or arches, of the curvature before alluded to; the massive buttress, with its deep weatherings or water-tables between each graduation or stage of the height, splayed angles, or angle columns, frequently to the different faces, and a simple pinnacle surmounting the whole. Add to these features, that the parapets of the period under notice often project from the face of the wall below, receiving an apparent support from the introduction of little ornamental blocks, masks, grotesques, &c. Ornaments of grotesque and foliage, indeed, are here, as in the later modes, frequently made to enrich string or cornice mouldings, base mouldings of pinnacles, &c. On turning from external to internal decorations, we observe the high groined stone ceiling, adorned, but with severe simplicity, by its moulded ribs; and springing from light columns, which are sometimes formed by an independent cluster of shafts, and sometimes by shafts attached like reeds around a greater cylinder, and apparently bound together by mouldings at intervals. A correspondent degree of simplicity is found to prevail in all the minor matters of embellishment. Such a style of Architecture is that to which Salisbury Cathedral, and much of that of Lincoln, belong; and the same may be instanced in the body of the Temple Church, London, and the Lady Chapel, Southwark. The style of this date is of so restricted an application, that it has nothing in common with Domestic Architecture; and we must, therefore, refer to ecclesiastical specimens to illustrate it. That we are justified in saying that such a style has nothing in common with the purposes of domestic structures, will, we think, be sufficiently evident upon a glance at the unmanageable character of lancet and triple-lancet windows, clustered columns, lofty groined ceilings, &c.; features in which resides the very soul of this kind of Architecture. In addition to this, we may observe, that, however effective the early pointed style is in the mass, its details are far from possessing that beauty, variety, and flexibility of form so naturally sought for

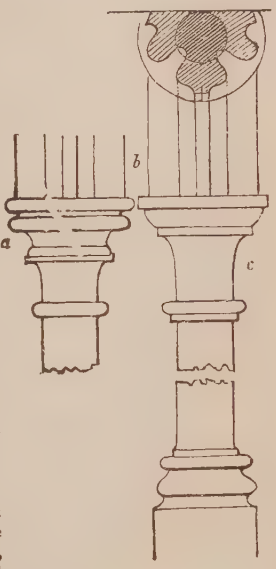
1616



by the eye that is familiar with the works of later date. Hence it is that Architects who will endeavour to imitate the more ancient mode are so constantly seen to run into the error of adopting with it the ornamental details of later periods; since they find their nominal style of too strict a character, both for their taste and their convenience, when applied to minutiæ. Thus, the embellishment of tracery (the well-known kind of ornament expressed in fig. 1617), without which little of richness can be bestowed on the detail of Pointed Architecture, exhibits, during the period under consideration, only the rudeness of the primitive form, as shown in the door-head, gable aperture, &c., of fig. 1616; being, indeed, not far removed from the style of ornament characteristic of the "Carpenter's Gothic," of which we shall have occasion to say more hereafter. The mouldings, also, in use at this time had not acquired either that variety or that distinctiveness of character possessed by those of after works. The moulded capitals and bases of columns might readily be traced to their Norman and thence to their Roman origin, fig. 1618, *a*, *c*. The ribs of groined arches, &c. (*b*, in the same figure), show in their section an excess of serpentine line; and a want of that significancy and fitness which characterise the mouldings of the fifteenth century. The foliage, likewise, of this date, was not unfrequently liny and poor, as compared with the full, undulating, and shadowy forms of a subsequent period. In short, the whole range of this species of the style exhibits Pointed Architecture in its infancy, sufficiently dignified and picturesque, indeed, to assert the superiority of the master principle; but not yet sufficiently refined to demonstrate the possibility of uniting qualities which later science has so successfully combined, the impressive in the total, and the exquisitely beautiful in the detail.

1617

1618

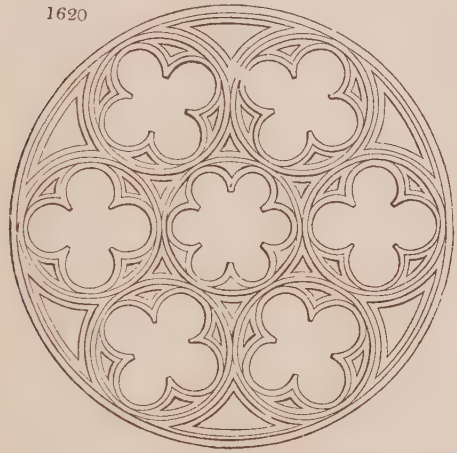


1883. *The Middle Period of the Pointed Style.* But, before the close of the reign of Henry III., the pointed style had entered upon that which we will designate its middle period of developement, which may be considered as extending thenceforward throughout the first half of the century following; viz., the fourteenth. The limits of this period we fix less with a regard to the lapse of years, than to the variation of style; and thus we consider such a work as Westminster Abbey to belong rather to this period than to the former, as having a greater affinity to the prevailing style of York Cathedral, which also comes under this middle class, than it has to that observable in the cathedral at Salisbury; although its completion may be said, on the average, to have followed that of the latter only at an interval of some twenty years. In the efficiency of the style, then, during its middle period, we discern very rapid advances towards perfection. Instead of a triple window, headed by three distinct arches, we see now single windows of as large dimensions, surmounted by one arch of the same tall proportion as before, being divided into two, three, four, six, or eight days (bays, lights, or compartments), by mullions, which, rising into the head, branch out into a great variety of ornamental outlines, enriched with tracery. The earlier and smaller attempts of this kind exhibit simple combinations on the same principle as that shown in fig. 1619. In larger subjects, the composition of the window head became, of course, much more complex; sometimes, indeed, uniting in one several such examples as fig. 1619, with that more elaborate one,

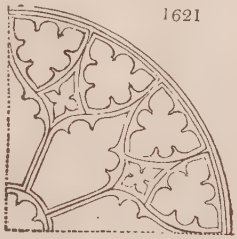
1619

fig. 1620, as a centre. In addition to the ordinary shape of windows, the builders of this period now adopted various forms of circular, Catherine wheel, or rose window: of such, fig. 1620 is properly an example; as is also that composition of which fig. 1621 shows a fourth part. Fig. 1622 is another variety of the same, sketched in

1620



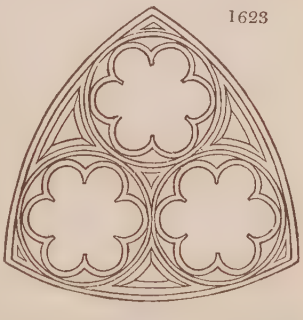
1621



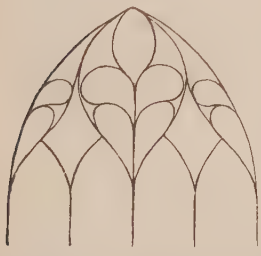
1622

outline, without its tracery. Triangular lights were also among the results of the exuberant fancy and taste of the day. Fig. 1623 is copied from one out of many examples of these. Of the composition of windows belonging to the period now under notice, it may be remarked that the earlier works exhibit a great profusion of that kind of design which is founded upon geometrical diagrams; in which the prevailing outlines are either curvilinear, as in figs. 1619, 1620, and 1623; or angular, as in fig. 1622. As, however, the resources of regular geometrical figures became exhausted, the artists of the time began to indulge in the use of *compound* curves, as in fig. 1621; and at length to design many of their window heads on such principles as those explained by fig. 1624, in which a disposition of parts takes place similar to that of leaves upon a stem. Besides the decorations of windows (the composition of which includes the elements of all the principal features of the style), those of doors became, during this period, much more elaborate and varied. A very common form of finish for the door head was that of the pyramidal label, or hood moulding (see outline, fig. 1625), which was enriched with crockets (such ornaments of foliage as those on the pinnacle top, fig. 1626), and sustained at the springing line by busts, masks, or knots; the space between the lines of the arch and those of the label being filled with compartments of tracery, &c. Buttresses also assumed a more decorative character, being frequently graduated, or diminished in their projection upwards, by the use of little gables, as shown in fig. 1627, which were often finished with crockets, &c. Pinnacles, too, as the terminations to buttresses, began now to exhibit the enriched aspect described by fig. 1626, springing from gables, and displaying much elegance and variety in their crockets and finials (the finial being that part of fig. 1626 cut off by the band of moulding at *a*). Embattled and perforated parapets afforded an elegant decoration to works of this period; and, without entering into a more

1623



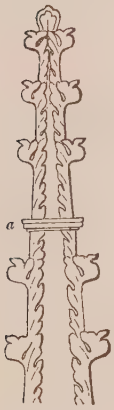
1624



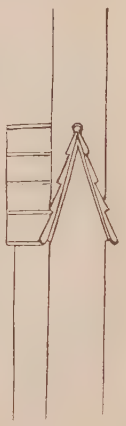
1625

detailed notice, we may add that a corresponding improvement in design characterised all the details of internal composition, whether groined ceilings, clustered columns, arches, screens, niches, or other features. It must, however, be confessed, that even this middle species of Pointed Architecture is, with all its merits as compared with that of the former period, imperfect in decorative character, and inadequate to the purposes of modern application in general, and to those of domestic fitness in particular. We have, indeed, given one example, fig. 1628, of a window of the middle of the fourteenth century, which may be considered of a legitimate character for domestic use; but it is to be viewed as assimilating rather with specimens of a subsequent, than with those of a previous, date. The style of the middle period is rendered unfit for ordinary application, by the unmanageable character of its high-pointed windows, doors, and ceilings; and, as to the question of beauty in matters of detail, we may remark, in general, that the composition of its window heads, and of its various decorations of tracery, though at first sight dazzling, does not or the most part offer to the eye, on a close examination, that graceful developement of curves, and continuity of line, and that union of delicacy with dignity, which constitute the great excellence of works of a subsequent date. Subject to the same comparison, too, the mouldings of the middle period exhibit a want of distinctive character and of systematic application; being frequently tortured into the forms of tracery, or made to do the office of columns, when, from their profile, they are rendered incapable of answering either purpose without clumsiness.

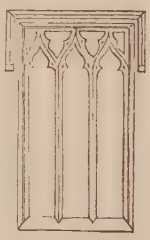
1626



1627



1628



1884. *The Third and last Period in the History of Pointed Architecture* displayed not only its master power and beauty, but also its universality of adaptation. This last period we shall consider as occupying a century and a half, from about the year 1370, which was towards the close of the reign of Edward III. The style of Architecture which then rose into prevalence has been denominated the "Perpendicular Pointed," the significancy and fitness of which term will be apparent to all who contrast the principles of composition in window heads and tracery at this period, with those which regulated the specimens of the former age. We may here observe that a distinction is drawn by some writers between the earlier and later varieties of the period, the works of which we here comprehend under one denomination; a distinction founded upon the fact, that the flattened or obtuse arch, which had its origin at the beginning of this period, was, till about the middle of it, made use of only for minor purposes, and in subordination to the simple-pointed or two-centred arch; whereas, in the latter part of the same period, the flattened arch assumed the predominance, giving a character of additional complexity and elaborate finish to all inferior matters of accompaniment. This distinction, however, is of little moment as compared with the greater differences which separate the perpendicular modes, both the early and the Tudor, from the classes which we have before noticed. Indeed, the unity of feeling which prevails throughout the whole of Perpendicular Pointed Architecture is so entire that we might safely adopt all its varieties of feature in one and the same work, provided such work were of sufficient extent to avoid crowded composition and violent contrasts. An example of the principal lines of window head appropriate to the early part of this period is given, divested of its tracery, in fig. 1629; and it will be observed that in this figure the perpendicular lines predominate in a manner which has no parallel in the case of either of the before-noticed instances. Indeed, the prevalence of perpendicular lines constitutes not only the distinction of this species, but forms also, as we before observed, one of the most striking characteristics of Pointed Architecture generally, as opposed to the classic styles; and it is in the works of the period now under con-

1629

sideration, that we see this characteristic producing its finest results, in airy lightness, loftiness, and dignity. It is observable, too (in noticing some of the principles of effect in the style before us), that the use of the pointed arch cooperates in a double manner with the tendency of perpendicular lines; for while, negatively considered, it supersedes the want of such features as beams and entablatures, and thus removes the depression of aspect consequent on numerous horizontal lines, it has a positive advantage in carrying the eye up both its curves to a lofty and decided point; unlike the semicircular form, which conducts the eye round, and downwards again, without fixing its attention any where. It follows, therefore, more especially in internal composition, that loftiness is essential to the attainment of the imposing; length being likewise so, as presenting to the eye a greater succession of lofty forms: and again, that perpendicular lines in an interior should not only be numerous, but continuous; as having thus a strong tendency to increase still further the apparent height, and more effectually to connect the various minor features of design. Force of shadow also contributes to the effectiveness of this style, no less than dignified forms of lines, and fine proportions. Porches, bold buttresses, octagonal turrets, oriel or bay windows, breaks, niches, &c., afford opportunities for the most striking management of light and shade; as well as for the multiplication of vertical lines. Besides these features, there are others which, to the varied effects of light and shade, add the interest of excited curiosity and imagination, resulting from a partial interception of the view; as in the case of screens, cloisters, projecting and retiring distributions of plan, &c.

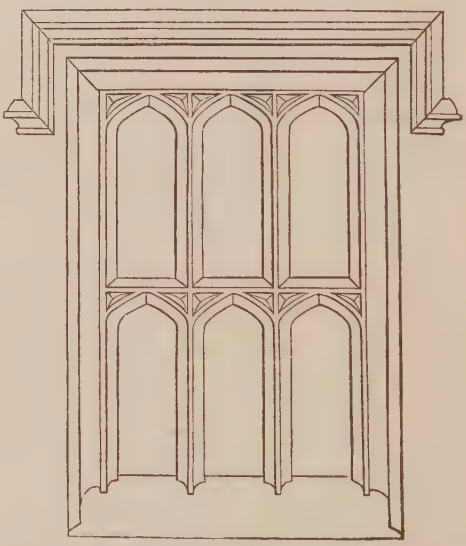
1885. *The Perpendicular Pointed Style, as applied to Domestic Architecture.* But, not to enlarge upon these and similar points, as affecting the style in general, we will consider that style with reference to Domestic Architecture in particular. Indeed, it is only (as before implied) in the perpendicular system, and that in its later practice, that we shall find either principles or precedents to direct us in domestic designs after the pointed mode; and, even those examples of the mansions of Tudor times which have reached our own day are to be regarded only as establishing, to a certain extent, a style of architectural decoration, and not as affording rules either for the arrangements of plan, or the minutiæ of practical construction. Before we proceed, however, we will just remark that we use the term "Tudor Architecture," in this place, under a limited appropriation, as referring only to the style in use during the reign of Henry VII., and the first part of that of his successor. The application of one and the same epithet to the pointed style of that period, and to the heterogeneous mode which succeeded it, and which prevailed through the reign of Elizabeth, though historically correct, is not architecturally explicit; and may have, we fear, a tendency to create a confusion of ideas as to the peculiarities of styles, not only essentially distinct, but diametrically opposite.

1886. *Of the Character of the more extensive Mansions of the Tudor Times*, a tolerably correct idea may be formed, by any one who is familiar with the Architecture of our English universities, on a reference to the arrangements of individual colleges. Indeed, we are disposed to think that the varieties of College Architecture may be fairly considered as open to domestic application, where the subject of execution is on a large scale; and that the strictness of character which some would make essential to propriety in dwellings, however extensive, is neither founded upon a comprehensive view of the subject, nor is favourable to variety and spirit in composition. We would not, however, be misunderstood as to this observation; for when a house is so small that it cannot be reasonably supposed to possess such appendages as a chapel and a dining-hall, it becomes a piece of contemptible affectation to finish its exterior with members which are naturally applicable to those appendages alone; and the only course, therefore, which good taste can sanction in such a case, is, to treat the subject as what it *is;* uniting an honest and obvious character with correct detail, and as much of the picturesque as circumstances will permit. The resemblance to which we alluded, as subsisting between the larger Tudor mansions and many of our collegiate structures, may be traced in the use of the gate-house, the first and second courts or quadrangles with their central fountains, the cloisters, the chapel, and the refectory or hall: the last standing distinguished by its characteristics of the oriel window, light louvert or lantern, open-framed roof, dais or raised platform at one end, and perhaps a screen and music-gallery at the other. In other instances, the necessary accommodation was comprised within the form of a parallelogram; a figure, of course, more suited to the purposes of economy than to those of display. In this case, the porch frequently took place of the gate-house, and the use of stone was often avoided by the execution of the plainer part of the work in brick, as became the practice in the reign of Henry VIII.; a favourite embellishment of such brickwork being that of lozenges and frets formed out of the over-burnt and vitrified bricks, sorted and used with a regularity which turned even accident to account. Then, again, we meet with smaller works of this period, the walls of which, except at the quoins and around apertures, were formed of flints, or of rubble covered with rough-cast; in

which case the eaves and gables of the roofs were very appropriately made to afford shelter to the walls by their great projection, while their ornamental character was improved by the use of carved verge-boards, showing either a continued pattern of foliage, or a profusion of undulating line and elegant tracery. One more variety of external character is that which results from the substitution of timber and plastering for solid walls, as seen in the streets of many of our old towns. Here, too, there is great opportunity for picturesque effect, as derived from the use of overhanging stories, each projecting beyond the face of that below it, to protect it from the weather, and being sustained by the continuation of the floor joists; the ends of which thus assume the appearance of a line of ornamental blocks, or corbels. The timber framing of the sides themselves, according to the old practice, is made to unite expression with economy, by giving an ornamental character to the crooked and less serviceable timber, and applying it to the purposes of diagonal braces in the squares formed by the vertical posts, and the horizontal plates and rails; in addition to which, the surface of the plastering is also occasionally relieved by various forms impressed upon it while moist. To this style of work, such finishings as the carved verge-board, &c., are also applicable as before; it is a style, however, which requires considerable discrimination, lest Elizabethan specimens, of which we have a great multiplicity, should be actually imitated, when those of an earlier date are professedly so.

1887. *Decorative Peculiarities of Domestic Pointed Architecture.* Having thus glanced at the varieties of general aspect exhibited in the dwellings of the end of the fifteenth and the beginning of the sixteenth centuries, it may be enquired wherein consist the decorative peculiarities of Domestic Pointed Architecture, as opposed to the decorative characteristics of ecclesiastical examples. We may reply that one striking point of difference is, that Domestic Architecture rarely makes use of pointed windows, but generally of square-headed ones, as in figs. 1628 and 1630, while the practice in the ecclesiastical style is just the reverse: both, however, are subject to variations. Domestic Architecture, again, is scarcely ever seen to adopt the common pyramidal pinnacle, not very frequently the buttress, and never the flying buttress; the place of the former being ordinarily supplied by the ogee pinnacle, and that of the others, in many instances, by a slender polygonal pier. High-pointed doors with pyramidal labels, niches and canopies, towers, spires, &c., are excluded from the features of the domestic style; as, in fact, are all those objects generally which have a tendency to produce an effect of solemn grandeur, rather than an air of liveliness and social comfort. The various members of Domestic Pointed Architecture we shall however proceed to notice more in detail; observing, at the outset, that it is with them that we have to do, rather than with any general modes of domestic arrangement and collocation pursued by our forefathers. If, indeed, the principles that regulate the form, application, and utility of such members individually, and their effects collectively, be well understood, we shall lose nothing of beauty or of character in departing from the old peculiarities of plan and disposition of rooms, while modifying component features to suit our wants. To pursue imitation farther than this would be, in fact, not only to check invention, and sacrifice sound judgment, but to oppose the example of our ancient predecessors in a most important point; namely, the readiness with which they modelled their architectural works to meet the changes of time and circumstance, and the demands of convenience.

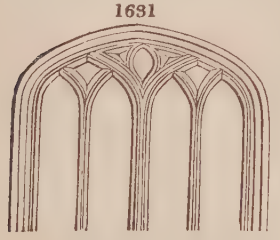
1630



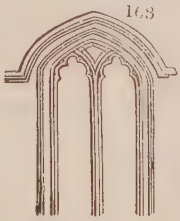
1888. *The Windows in the Pointed Style of Domestic Architecture.* In turning to the individual members of Domestic Pointed Architecture, the first to occupy our attention is the window, a feature upon which our old builders delighted to lavish their skill and

fancy. It may be worthy of remark, that, as another difference in procedure between the style under consideration and the classic modes, the former endeavours to make those members most attractive which are the most indispensable; while the latter bestows the greatest share of ornament upon parts which are rather the result of luxury than of necessity. Hence, while the remains of Grecian and Roman Architecture produce their finest effects by the decorations of porticoes and colonnades, those of the middle ages, in our own land, make the window and the door the main sources of interest, causing even solid masonry to assume a playful arrangement and a luxuriant richness, which, if we could suppose such a subject beheld by an ancient Greek, would seem to him little less than the work of enchantment. Though this is the case, as viewed in general, it is not, certainly, in Domestic Architecture that we can see the composition of the window carried to its finest display. Indeed, by some, the use of the pointed window, for domestic purposes, is entirely prohibited; the only appropriate forms being supposed to be those of the square-headed window, and the oriel or bay. In all works that are on a small scale, the introduction of the pointed-headed window, sharp or obtuse, would certainly indicate a very erroneous taste. We cannot, however, at all understand how the strictness of the prohibition can be maintained under circumstances wherein a domestic building assumes the character of magnitude and complexity. It assuredly cannot be maintained on the ground of precedent; for, in the old dining-halls, pointed windows were features of constant recurrence: witness the halls of Eltham, Hampton Court, and Croydon; or, if it be objected that these are instances of a palatial and not an ordinary domestic character, take a more unassuming, but not less interesting, example in Crosby Hall. Neither are we disposed to admit as valid the objections to pointed windows, founded upon the supposition that they must necessarily be insecure, because they cannot be closed their whole height by shutters; and that they must also be inconvenient, because not suited to the ordinary arrangement of drapery. As to the question of security, we should think that shutters might be altogether dispensed with, where a window is divided into narrow spaces by stone mullions, and these, again, by stout iron stay-bars to hold the lead-lights; or, if not, still the part which remains undefended by shutters, being the window head, is the very part that is best guarded by an increased strength and intricacy of masonry. As to inconvenience on the question of drapery, we have only to say that a pointed window is misapplied unless it be in a large, or at least a lofty apartment, and one in which sufficient space may be spared between the window head and the ceiling to allow of the necessary provision on the part of the upholsterer. Of pointed window heads, as applicable to our present subject, figs. 1631 and 1632 exhibit sketches; the former from Hampton Court, the latter from Crosby Hall. If, however, compositions of a more elaborate character be at any time required for domestic purposes, the chief points for attention will be, first, the subdivision of the window, when of more than three lights, into principal and minor portions, by the use of greater and smaller mullions, as shown in fig. 1629, without which there can be no force or expression of design; and, secondly, the preservation of continuous and flowing lines, without which there can be no gracefulness or repose: of course, we are presupposing a regard to propriety in the forms of moulding and of tracery. The other kinds of window belonging to Domestic Architecture are the square-headed and the oriel. Of these the former will be understood by reference to fig. 1630. It is frequently (as there shown) divided in height as well as width by a transom bar, or cross mullion; each compartment being usually headed with a flattened arch, — usually, we say, for the practice is not without variation; and, though some writers have considered the omission of this arched head, whether above or below, as a mark of Elizabethan taste, it certainly is not exclusively so. Indeed, windows divided by mullions into compartments of the simple oblong form were in occasional use a century before the time of Elizabeth; nor are they at all opposed to that principle of Pointed Architecture which requires the use of an arch for the support of superincumbent weight; since, from the smallness of the spaces in proportion to the solids, the openings of such windows come under the rule of panels, rather than under that which governs the management of larger apertures. Simple as these windows may thus be rendered on the one hand, they are susceptible, on the other, of as much richness of decoration as may be required. An elaborate specimen, for one out of many, of the ornamental kind, may be seen in the cloisters of Christ Church, Oxford. The square-

1631



1632

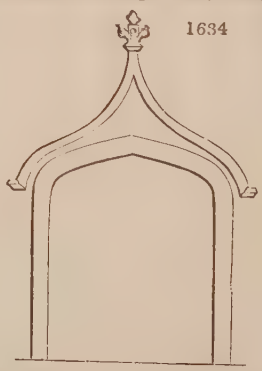


headed window is for the most part finished above with a label, as in fig. 1630, passing down the sides to the springing line of the arches (if there be arches to the different lights), and finished ordinarily with a plain elbow; sometimes with a twisting of the mouldings into the form of a lozenge, or occassionally that of an octagon; and sometimes with a shield, bust, or figure. The oriel, or bay window, may be described as being, for the most part, a kind of three-sided compound of the last-mentioned description. Of this there are two principal varieties; the one of large proportion, rising immediately from the ground; the other of a smaller character, and standing out from the surface of a wall upon projecting or corbel mouldings. The former was that generally in use in dining-halls, and may be seen finely exemplified at Eltham Palace, at Crosby Hall, and in many of the halls of Oxford and Cambridge; the latter was more appropriate to the chamber, and is instanced in beautiful taste at John of Gaunt's Palace in Lincoln, Magdalen College in Oxford, and numerous other places. In the adoption of either of hese varieties, it is highly desirable, wherever it may be at all compatible with modern convenience, that the old style of glazing in lead-lights and quarry (or lozenge) squares should be continued, as greatly conducive to the character and picturesque effect of the whole; and though the old casements formed in this manner were not remarkable for soundness, or retention of warmth, there can be no reason why the application of modern improvement should not make our own as commodious as are the French casements of the present day. If, however, wooden sashes must occasionally be used, great care will be needed to render their appearance as unobtrusive as possible, and to prevent their disfiguring the mullions of the window, either externally or internally. A window of ordinary width, undivided by a mullion, and filled in with regular broad sashes, be it dubbed Gothic or what it may, is only fit to be classed with the execrable designs of Batty Langley. The management of window-shutters, if, indeed, they are to be adopted at all, is a point attached to the former that is attended with considerable difficulty. The common boxed shutters may and do answer their purposes in our ordinary style of domestic construction; but they have nothing in common with Pointed Architecture; and, if used at all in connection with it, will need to be altogether remodelled. It would require an elaborate drawing to afford an adequate idea of our views on this subject; the principal point, however, to be borne in mind, is, that a window, when closed up by its shutters, ought to present as perfect and architectural an appearance in all parts as when open. The customary finishings of architrave, soffit, &c., are entirely out of the question; the character which the whole composition must assume, to conform to the massiveness of the pointed style, being just that of a window enclosed with folding doors.

1889. *Doors in Pointed Domestic Architecture.* We may next proceed to the door, or rather the doorway, of which the perpendicular pointed style furnishes us with several varieties applicable to domestic purposes. For the large proportions of the principal entrance doorway, a common and simple form is that of the obtusely arched opening, shown in fig. 1633, with a label to correspond with the curvature of its head. Sometimes this label assumes the outline of the double ogee, as in fig. 1634; being then

1633

1634

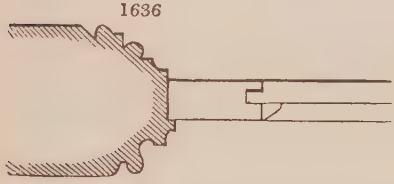


terminated by a finial, and often enriched also with crockets. At other times, and for all subjects, the square form of label is of frequent use; the decorations of the doorway being filled out to a similar and suitable shape by the introduction of spandrils of foliage or tracery, fig. 1635. This variety is applicable, like the others, to the simple pointed or two-centred arch; but is more frequently found in connection with the flattened or obtuse. There are many instances of pleasing forms besides those already noticed; but they occur only under circumstances of minor importance, and do not belong to the

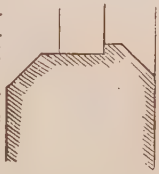
class of regular features. As to the details of doorways, it will be observed, in general that their jamb mouldings are of a somewhat more complex character than those of windows, abounding in slender columns, based beads, ogees, and quarter and casement hollows; which are ordinarily brought down, and made to terminate upon a splayed face at some distance from the ground, so as to produce a neat developement of their profiles; or at other times, as economy or simplicity may require, the mouldings appear only in the arch of the doorway, being made to die away about the springing line against the jambs, which remain plain. The character of solidity which is necessary for effect in door jambs may appear to be occasionally attended with difficulty of treatment; as, for example, in the instance of a door in a common lath and plaster partition. Hence, some modern imitators have not scrupled to adopt, in cases of that kind, such incongruities as architraves on the Grecian or every-day principle; though it would be far better that the pointed style should be left unattempted, than affected in so barbarous a manner.

1635

1636



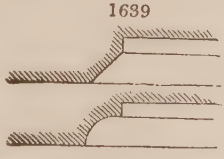
1637



The case which we have supposed is one which certainly admits of little decoration, but that little will have sufficient merit in being consistent, whether it be that of a simple moulding, like fig. 1636, or a mere splay, as in fig. 1637; the general rule being, that the mouldings of door or window jambs should commence with the surface of the wall or substance, and cut into the solid at an angle of not less than forty or more than sixty degrees, fig. 1638. Together with the varieties in doorways, we have also, in the style before us, varieties as numerous of doors themselves. The simplest of these is the ledged door, studded with nails, and frequently adorned with massive flourished hinges and strengthening irons. Some specimens there are of doors covered with continuous patterns of wrought iron; exhibiting, with considerable delicacy, successive ramifications of foliage and flower-work. Others, again, are framed in panels, the rails and styles being thick, narrow, and deeply moulded; the mouldings very similar to those of mullions in windows, and the fillet, which usually forms the most prominent of them, being studded with nails. In folding doors of this kind, the outer meeting style (as it is technically called) was usually finished with a little buttress, or columnar bead, to hide the joint. A degree of additional richness was given to such doors by the introduction, in their panels, of compartments of foliage, or, very frequently, of long opened scrolls; but the greatest display was that which arose from the use of tracery, with which doors were sometimes so elaborately ornamented as to equal in intricacy and beauty of design the most costly tabernacle-work. Here the same difficulty as before is presented to the ordinary modern imitator, when he finds himself obliged to attempt consistency under more economical circumstances, and with doors of a less substantial character than those in ancient use. Hence, under the notion that the sum of propriety consists in the imitation (no matter how distant) of arches and tracery, he plants on the panels of his "square-framed" door some thin laminæ of deal, just cut through into trefoils or quatrefoils, and considers his work as performed to admiration. Such an imitation, however, would be far surpassed by a door framed quite plain and flush on both sides; for the latter exhibits at least nothing faulty, while the former is altogether a caricature. In a paneled door of thin substance, the only kinds of moulding which can be used with correctness are the simple hollow, or the splay, as in fig. 1639; because these are the only mouldings out of which tracery can be formed, and all paneled work in Pointed Architecture is presumed to be susceptible of the finish of tracery, though it may not actually possess it. Projecting (or what are technically called bolection) mouldings are quite inadmissible in doors and framing of the style before us; and we need scarcely

1638

1639



add to what we have already said, that such things as a square-topped door and opening, in however obscure a situation they may be placed, are as much opposed to the character of that style, as a pointed door would be out of place under the great portico of St. Paul's. In fact, though the judgment which some entertain as to matters of taste may be satisfied with giving an architectural appearance to the prominent parts, or to the exterior of a building, while all the rest is left destitute of character; we cannot think very highly of any structure claiming the name of Gothic, which does not preserve uninterruptedly the charm of association, and which is not at unity with itself, from the largest decorations of masonry down to the minute finishings of the ironmonger. For even in this last department there is a style of design which also requires attention; and there is no want of precedents for knockers, hinges, locks, escutcheons, latches, drop-handles, and the like, all which should be in keeping with the rest, though they will certainly admit of some modification, to suit the various improvements of more recent times.

1890. *Gables in Domestic Pointed Architecture.* Of external features the window and the door must be undoubtedly regarded as the most important; next to these the gable is that which, perhaps, contributes most to the characteristic effect of Domestic Architecture, and, indeed, to that of Pointed Architecture in general, by harmonizing with the tendency of perpendicular lines. In this style we have the simple gable of two lines, following the rake or slope of the roof; and the stepped gable, which may be compared to a pile of battlements, or to the form of line called by heralds "battled embattled." In the later practice of the Tudor times, we frequently see the apex of the gable finished by the introduction of a little octagonal shaft, bearing a moulded capping cut into battlements, and crowned with a pinnacle, of which the outline (as before noticed) was that of the double ogee; such pinnacle being frequently enriched with a leaf ornament, not unlike fish scales, or with a kind of honeycomb pattern of mouldings. A substitute for the pinnacle was often found in the figure of an animal, as a heraldic supporter or cognizance, sustaining a flagstaff, on which the banner acted as a vane, at the same time displaying in full blazon the armorial bearings of the proprietor. The same style of termination prevailed very generally also at the various angles of buildings belonging to the Tudor period; such pinnacles or finishings being made to surmount slender octagonal piers or shafts, which rose from the ground to fortify the corners; and which, in the time of Henry VIII., commonly superseded buttresses for domestic purposes. In dwellings of a date prior to that period, there are, however, instances of the adoption of the buttress quite sufficient to prove that it was not then regarded as a feature exclusively ecclesiastical, though some modern writers have pronounced it such. The truth is, that the buttress was used by the old builders with a primary reference to its utility; and it is because the stone vaulting and massive roofs of churches so frequently demanded a resistance to their great pressure, that we find the buttress almost identified with Ecclesiastical Architecture. Where, however, the same necessity for its adoption arose in domestic work, it was applied without hesitation, as it is, for instance, against the walls of Eltham Hall, to counteract the thrust of a roof as ponderous as it is fine. In fact, the buttress, like the pointed window, must be used sparingly; and only where it conduces, at least apparently, to the addition of necessary strength and stability, as well as to the purposes of decoration: to apply either to dwellings whose construction is simple, and whose extent is small, would be unmeaning and improper.

1891. *Chimney-Shafts* are additional features which contribute greatly to the picturesque effects of Domestic Architecture. These are sometimes square, arranged diagonally in clusters; sometimes octagonal, occasionally having the faces curved inwards; and sometimes round. Under the latter form especially, their decorations are often very elaborate, the shafts being frequently traversed by a succession of spiral reeds, or by the same again in opposite directions, so as to divide the whole into small lozenges. Sometimes a similar moulding forms the surface into hexagonal figures; and at other times, in connection with hollows, exhibits parallel arrangements of zigzag lines. Other varieties show the shafts covered with a repetition of the fleur-de-lis, lion, rose, &c. These are all finished above with a polygonal capping, frequently cut into battlements; and, below, with the usual plinth and plinth mouldings, following the same plan, and all sinking into (uniting with) the inclined upper faces of a general block or pedestal.

1892. *The High Roofs of Pointed Domestic Architecture*, also, though subjects which admitted of little ornament, were not left without relief by our old builders. This relief they derived, variously, from the use of numerous lead rolls, when lead was the covering; or, in other cases, from the employment of shingles or wooden tiles of different shapes, producing a pleasing alternation of line; besides which, there are instances of a finishing for the ridges of roofs, formed of what were called crest tiles, a little ornament of open work, bearing an application very analogous to that of the ridge tiles of the Greek temples.

1893. *The Octagonal Turret* (which in the old style of arrangement was frequently

made to contain the staircase) was another feature possessing as much of external effect as of internal utility. Finished with its loop-holes and battlements; decked (as, indeed, were the parapets in general) with "gargoyles," "gargells," or spout-heads, or otherwise terminated with the crocketed ogee cupola, it always imparted to the mass relief, dignity, and ornament. This, however, together with the porch, a member of kindred interest, belongs to the various principles of composition in detail, and will not admit of any fixed definition in this place.

1894. *Internal Effect.* We pass from the notice of these subjects of external design, to the consideration of those which are most essentially concerned in the production of internal effect. Of such, the ceiling undoubtedly possesses the greatest share of importance in works that pretend to the maintenance of a decorative character throughout. The varieties of ceiling, or (to use a more comprehensive term) of internal covering, are numerous; belonging to the departments both of masonry and carpentry. In ancient specimens of the former, we have the groined and ribbed ceiling, the simple vault with transverse ribs, the fan-groin, and the disguised flat ceiling; in the latter we have the open-framed roof, the enriched wooden vaulted ceiling, the ceiling of two inclined planes, and the flat ceiling in panels: each of these, however, will demand a separate notice.

1895. *The Simple Groined and Ribbed Ceiling* will be understood by every person of ordinary observation, as being the sober kind of vaulting most frequent in our larger ecclesiastical structures. It is, however, very rarely to be imitated with propriety in domestic works, since it requires a loftiness of proportion altogether foreign to the usual character of habitable apartments. In situations where the width is small in comparison to the height it may be adopted with effect, as in cloisters, porches, and entrance halls; but it is totally misapplied when made to encroach upon the sides of a room whose height is barely equal to its width.

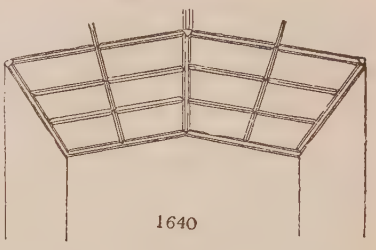
1896. *To the Plain Vault traversed by Ribs of Moulding* the same observations will apply, though this form is somewhat more manageable than the preceding one, in consequence of its requiring less curvature than is necessary for the display of groining (which term the reader will understand to refer to the figure produced by the intersection of one pointed vault with another, whether lofty or flattened). This second and simpler kind of ceiling admits of much pleasing decoration, from the introduction of tracery in the compartments formed by the cross ribs, accompanied by the use of foliage in the springing cornice, and sometimes of little corbels or pendants, as attached to such cornice, under the feet of the principal ribs.

1897. *The Fan Groin* is the next description of ceiling, the general character of which is that of a number of circles in contact, each divided by radiations of moulding and tracery, springing from a pendent centre; and thus producing the outline of a flattened arch between every two adjacent centres. This variety is susceptible of a richness of decoration far greater than that of any other ceiling in Pointed Architecture (beautiful as they may all be rendered), exhibiting, even when least adorned, an airiness of character, and a play of light altogether enchanting. It is a variety, also, that may be applied with facility to the purposes of Domestic Architecture; though it will be proper to bear in mind that we should not, in lath and plaster, multiply pendants, &c., to an extent that would involve impracticability of execution, supposing the subject to be attempted in masonry.

1898. *The Disguised Flat Ceiling* is another kind which is not without example, as being executed even in stone. This consists of a horizontal plane, relieved with the customary forms of moulding and tracery, the principal lines of which have a little curvature at the points whence they diverge; so as to give to the whole outline, at first sight, an appearance somewhat analogous to that of the arch. Of the application of this variety we shall speak hereafter.

1899. *In their ornamental Carpentry*, both as to roofs and ceilings, our forefathers were no less successful than in their masonry. The open-framed roof, which we have before named, exhibits, in several remaining instances, proofs of their skill in uniting the ornamental with the useful, and giving to their subject depth of shade and colour, and fulness of design. Witness the roofs of Westminster Hall and the hall at Eltham; compositions which will afford valuable hints to the Architect, as to the covering-in of large and lofty apartments, for which boldness of character is desirable. Another variety we have noticed as being that of the vaulted ceiling of wood, of which the decoration is very similar to that of the parallel feature in masonry already described. Its ornamental appearance may be also enhanced by the introduction of trusses of arched ribs, with spandrels (or corner pieces) of tracery, enriched corbels, pendants, &c. For instances of both of these we may refer to Crosby Hall. Another kind of ceiling, very common in old churches, but very applicable, also, to domestic purposes, is that formed (as before mentioned) of two inclined planes, as in fig. 1641: the ceiling and the roof being, in

such cases, generally one and the same thing. The roof, thus simply constructed, showed its principal timbers and rafters, moulded on the under side, as greater and secondary ribs; the lead boarding forming the faces of the panels, and the points of intersection being often profusely adorned with knots of foliage, and the like. Some examples we find, of a date subsequent to the introduction of plastering, in which the plainer parts are of that material, the ribs only being of wood. To the principal ribs were often attached curved springing pieces (fig. 1641), so as to give to the whole the contour of the flattened arch; the weight being then sustained, on each side, by an ornamental corbel or capital. One more variety is that of the flat ceiling in wood; sometimes simply divided by ribs into square or oblong panels, and at other times disguised by much the same kind of treatment as the flat stone ceiling of which we have taken notice. On a principle not very dissimilar to this is executed the wooden ceiling of the withdrawing-room at Hampton Court Palace (fig. 1642), exhibiting a succession of stars, bearing some analogy to the arrangement of the fan-groin; an example which, if purified from its admixture of Italian detail, might claim as much merit as a flat ceiling may generally be expected to possess.



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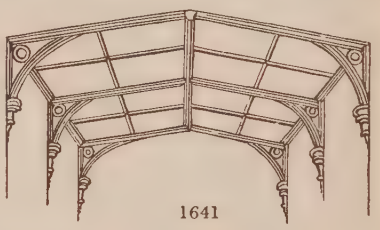

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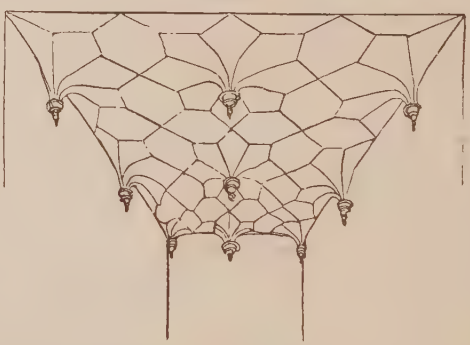


1900. *The Form of Ceiling which is most applicable to the combined Purposes of Taste and Convenience in Domestic Architecture*, we consider to be that of two inclined planes. The flat ceiling must necessarily have the advantage over every other kind, in point of economy; but it is greatly deficient in character, as, in its general form, it recognises nothing of the principle of the pointed arch; a principle upon which the effects of the pointed style primarily depend; and a regard to which is conspicuous in each of the other varieties which we have enumerated. Even in the simplest of these, the ceiling of two inclined planes, though the rise in the middle may not be greater than eight or nine inches, in a width of sixteen or seventeen feet, there is still a distinct and sensible analogy to the form of the vault, in the upward tendency of the lines, and in the preservation of a lofty central point. When, on the other hand, so important and prominent an object as the ceiling is destitute of a characteristic form, let decoration be applied as it may, it will fail to supply the deficiency, or to relieve the composition from the charge of ambiguity. If there be any circumstances under which the use of the flat ceiling may be considered excusable, it becomes so only when used in rooms whose windows finish with square upper lines; in which case, such lines may harmonise, to a certain extent, with the horizontal surface above. To place the flat ceiling over pointed windows is to destroy all unity of feeling, as well as to show a great misapplication of economy.

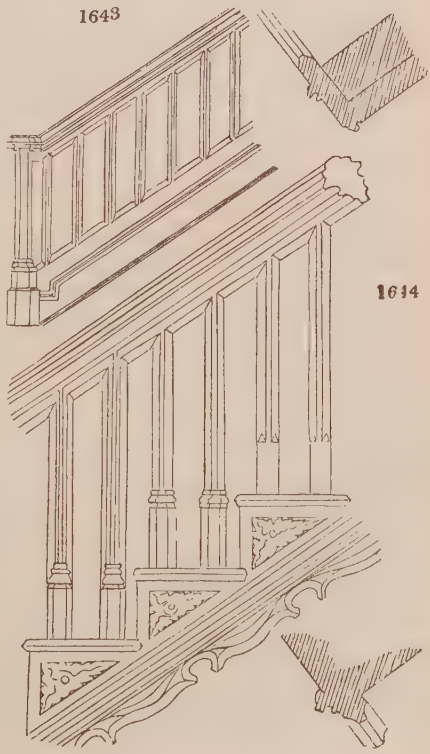
1901. *Floors, in the Pointed Domestic Style.* But the lowest as well as the most elevated objects shared the attention of our old builders, and contributed to the completeness of composition. Hence, in their more finished structures, the decoration even of floors was not neglected; the practice being to intermix, with stone paving, ornamental glazed tiles, of varied colour and device. For these the achievements of heraldry afforded the most copious exemplars; the subjects being disposed of in circles, quatrefoils, lozenges, &c. At other times, single and ordinary objects were adopted; or, for more economical

purposes, mere alternate patterns of different colours. The best of these tiles were executed by indenting the required ornament in the substance of the clay while moist, and filling up the vacuities with clay of a different colour, after which they were subjected to the fire. Unfortunately, however, many of them appear to have had their embellishments applied only to the surface, and their subjects have consequently been soon obliterated. In porches, halls, conservatories, &c. in which the pointed style is imitated, the paving might be consistently interspersed with tiles of this description, which, probably, would not prove expensive, when their manufacture had once been tried with success. [Mr. Wright's tiles (§ 1785) are exactly what is here described, but are manufactured in a superior manner.]

1902. *Chimney-pieces* are matters of internal design which require much judgment, and which would admit of considerable decoration, were excellence of workmanship preferred to expensiveness of material. As it is, indeed, the pencil is often fettered by the fear of massiveness on the one hand, and of waste on the other (when marble is the substance to be employed), no less than by the want of spirit and feeling. Boldness, however, is here essential to character, the composition of a well-designed chimney-piece differing little from that of a gateway in miniature, reduced to a flattened proportion, and sometimes finished above with a course of tracery compartments, and a ledge, scarcely to be called a shelf, arising from the projection of a massive cornice moulding; the whole being bounded on each side, perhaps, by a slender column, or octagonal shaft, attached to the jambs. On the other hand, this feature may be reduced to an extreme of simplicity, equal in economy to that of an ordinary bed-room chimney. It is, however, to be so reduced by a regard to the primitive forms of arch and jamb, and not by the sinking of a quatrefoil on the blocks of an every-day article, and calling it Gothic.

1903. *The Staircase.* One conspicuous object of internal arrangement which remains for our notice is the staircase. For this, unfortunately, we have scarcely any precedents in old works applicable to the modern principle of construction; the common arrangement being, anciently, that of the corkscrew stone staircase, still used in church towers, of which the steps become the radii of a circle, each lending its aid to form a round newel up the centre. The great staircase of Christchurch College, Oxford, is one example more closely resembling the modern plan; but it is one upon a scale of splendour rarely to be approached under the economical restrictions of the present day. It will, however, afford many useful hints to the student; hints which will be seconded by every principle of architectural analogy and right feeling; and this, among the first,—that Pointed Architecture knows no such finishings as those of the common rail and baluster; but that, if an equivalent to such be wanted, it must be gained under the form of the coping-moulding and the mullion. Another point of observation will be, that what are called continued handrails (even supposing their section to be correct), are neither so manageable nor so characteristic for Pointed Architecture as those with newels, belonging to the form of the square well-hole, or to what is technically termed the dog-legged staircase. In figs. 1643 and 1644 we have offered some ideas upon this subject, as applicable to the purposes of modern domestic use. In fig. 1643 the staircase is finished with a close string-board, and with balusters which take the character of plain mullions. It is easily to be perceived that the forms here simplified will admit of any degree of decoration, by the introduction,

1643



1644

at pleasure, of arched heads and tracery to the different compartments, and the enrichment of the string-board, if requisite, in a correspondent style. Fig. 1644 shows the same principle adapted to the form of the cut string, or that which leaves exposed the ends of the steps. In this, therefore, it is necessary to give to the mullion baluster a kind of base, to prevent its receiving an abrupt termination upon the step; and this we have sketched as attainable in several ways, of which the uppermost form will be perceived to be reduced to its simplest principles. The compartments produced under this mode of arrangement are, of course, susceptible of additional decoration by the same means with those of the former figure; and, on the other hand, the ornamental string-board which we have here introduced will admit of simplification if necessary.

1904. *External Colouring.* Not to pursue our notice of detailed features to an extent which might perplex the reader with minutiæ, we shall conclude by offering one or two remarks upon some matters which have a close collateral reference to the subject in general. Of such matters, primary and evident importance attaches to the circumstance of colour. This, though it does not, strictly speaking, come under the cognizance of Architecture, has a very powerful influence upon its productions. Hence, viewing the subject with a reference to external effects, a building newly erected is, notwithstanding the entireness of its finishings, far less pleasing to the judicious eye than that which has had its tints softened by the wear of years. The attention of the Architect should therefore be directed to a consideration of the effect which the lapse of time will have upon the materials of his works. He will accordingly see the propriety, in matters of external woodwork, doors, verge-boards, &c. &c., of employing, where practicable, a sound wood, like oak, in preference to an imitation in painted deal, of which the tone of colour can never be improved by time. In instances where a partial restoration of old remains causes a spotted and unharmonious appearance in the general aspect, he will do wisely to subdue the glare of new materials; as may be done, in stonework, by the application of boiled oil, coloured water, &c. In cases where the fiery tone of red brick requires to be lowered, or where blank spaces may demand relief, his object may be effectually answered by the training of ivy, or any of the varieties of American creeper, against his walls; a mode of natural embellishment which imparts even to simple objects an air of shadowy richness; subdues, in rural scenery, the violence of the transition from objects of nature to those of art; and even bestows upon the architectural subject of recent date somewhat of the charm belonging to the venerable. He will, at all times, shun the use of lime-white for external objects; and, if imitating, at any time, the old style of erections in timber and plastering, he will act judiciously in modifying the antique character of colouring, by substituting, for the favourite red and white, a brown and a deep and softened stone tint.

1905. *The Application of Colours for internal Purposes* may be made productive of great effect. The old style of painting upon minute architectural subjects often exhibits the richness of appearance resulting from the deep colouring of hollows, striping of beads, and gilding of fillets and foliage; and, at other times, displays the effect of painted foliage in trelliswork; of figures, with bands and inscriptions of mottoes, "posies," and proverbs; thence advancing, even to the full extent of the skill of the times, in paintings of a historical character. Beyond this, the effects of colour were occasionally heightened by the use of painted glass; the principal subjects for domestic application being those of armorial bearings, badges, mottoes, and foliage.

1906. *Fittings-up and Furniture, in the Pointed Style.* We might here particularise the old decorations of hangings and tapestry; from which we might pass to a detailed investigation of the peculiarities of ancient furniture, as another collateral matter affecting unity of character and feeling. We should, however, be unable to do justice to this latter subject, without multiplying our sketches and remarks so as to exceed our proposed limits; and can only, in this place, express our regret that the execution of furniture, as appropriate to works in the pointed style, should ever be confided to tradesmen, who cannot, in reason, be supposed to have studied this class of Architecture with that patient attention which is necessary to a comprehensive acquaintance with its spirit; not to say that, of all the regular subjects of the style, scarcely any require the display of such feeling and judgment as do these collateral objects of fittings-up and furniture.

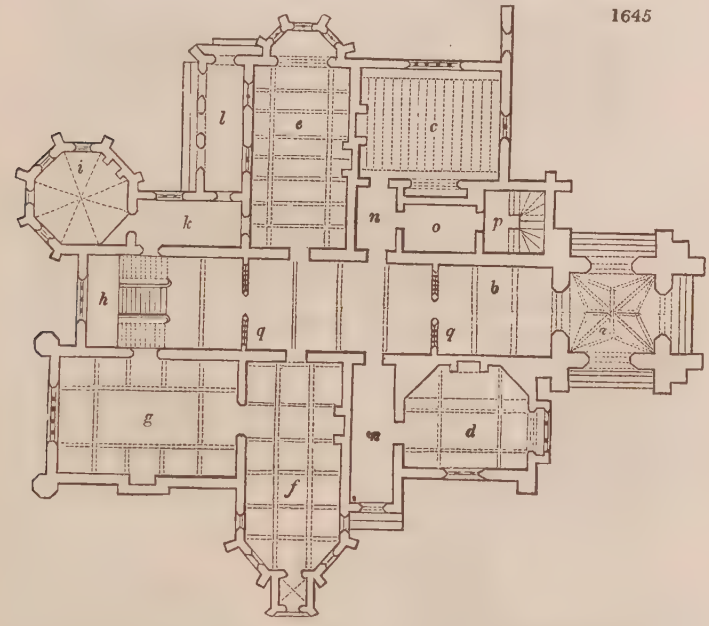
1907. *Conclusion.* We shall not extend our observations to matters of a more minute description, or a less intimate connection with our subject; and shall only beg to observe, in conclusion, that we have not offered the foregoing sketches and remarks with any such view as that of qualifying the reader to become at once a composer in Pointed Architecture; an attainment for which the study of years will not be more than sufficient. Our object is, rather to lead the student to seek a more intimate acquaintance with the characteristics of this unrivalled style of art; and to suggest to him and to the amateur a few ideas which may place them on their guard against the pretensions of false taste, and the innovations of ignorant and soulless imitators. This caution will be the more

readily received, when it is remembered that men of no less celebrity than Inigo Jones and Sir Christopher Wren exhibited the most miserable failures, whenever they attempted Pointed Architecture: and it is, therefore, evident, that nothing short of an entire devotion of mind can insure an adequate command of the style; a style which must necessarily be profound in its principles, to stand, as it does, supreme in its effects.

Design XXII. — *A Villa in the Gothic Style.*

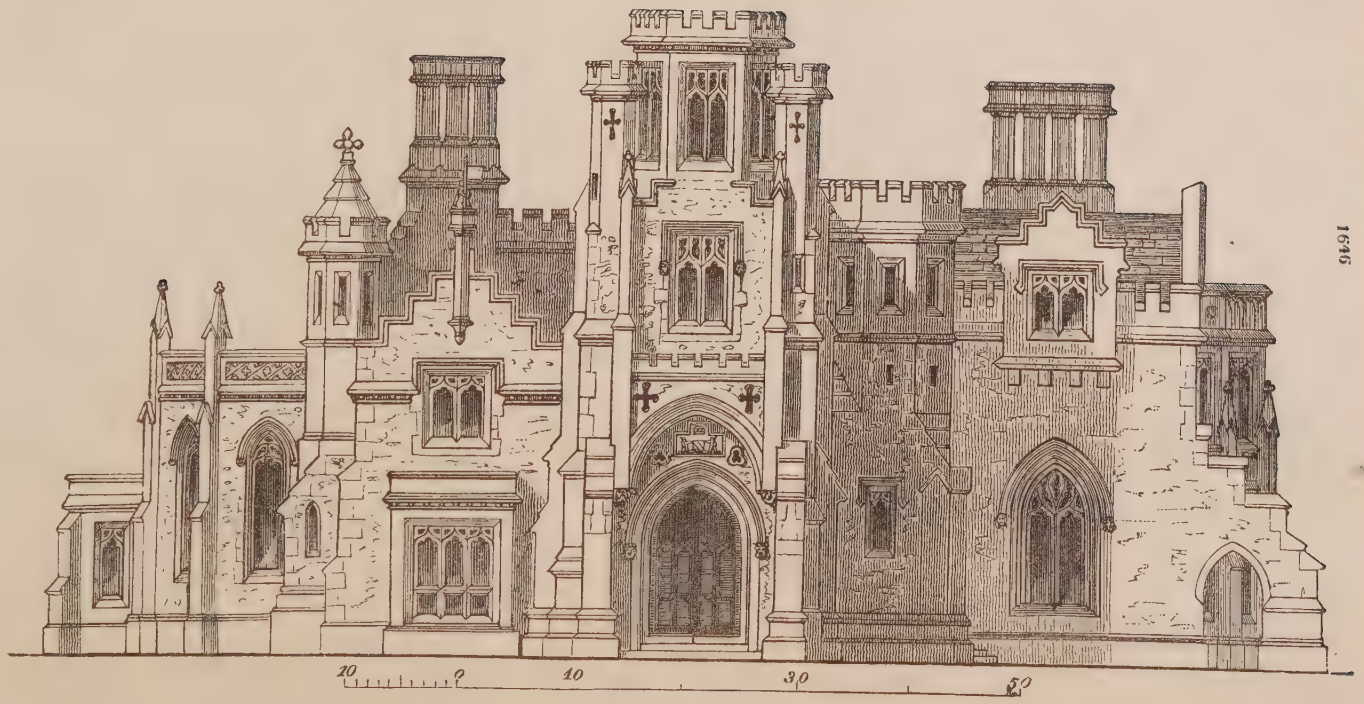
1908. *Situation and Accommodation.* This villa is supposed to be placed on the summit of a knoll, in a country rather flat than otherwise. For this reason, the general

1645



outline against the sky is rendered more irregular than it would be in a country where the surface was greatly diversified. As the building is supposed to be viewed on every side, and to have no immediate background of either wood or hills, the different projections in the sides, as well as the sky outline, are calculated to produce a picturesque effect from every point of view. The basement on which the whole is intended to be placed, should be raised and supported by an architectural terrace, irregular in the plan, and displaying projections corresponding, for the most part, to those of the building. This terrace should not be less than three feet above the surface of the adjoining grounds, and on the entrance front there should be an inclined plane, by which carriages may ascend to the porch. The terrace wall should be finished with battlements at the more enriched parts of the garden front; and it may be finished with a plain parapet and coping on the entrance front. Fig. 1646 is the elevation; fig. 1645 is the ground plan. In this last, *a* is the porch; *b*, hall; *c*, dining-room; *d*, breakfast-room; *e*, drawing room; *f*, library; *g*, picture gallery, serving also as a billiard-room; *h*, principa staircase; *i*, boudoir; *k*, ante-room; *l*, archway to the garden scenery; *m*, passage, a the end of which is the bell turret; *n*, lobby; *o*, ante-room; *p*, back stairs; and *q*, open screens. The dotted lines indicate the manner of finishing the different ceilings. Some of these (for example, the porches and the octagon boudoir) indicate groined ceilings; but the square and parallelogram plans contain lines which indicate the mode of finishing by panels between oak beams, familiar to every one who has seen an old Gothic dining-hall in any of our colleges or inns of court. The domestic offices are in the basement; there is one story over the principal floor for bed rooms for the family, and an attic story for the sleeping-rooms of the servants.

1909. *Construction.* Fig. 1647 is an elevation of the hall door. Fig. 1648 shows



1646

part of the open staircase. Open staircases, Mr. Lamb, the author of this Design, observes, were not generally used until the middle of the reign of Queen Elizabeth; but the effect of the interior of this Design will be very much improved by one. The stairs to the stalls in Henry VII.'s Chapel afford a sufficient precedent, if one be necessary. Previously to the period alluded to, staircases were placed in small towers, and called turnpikes; the steps of which were of stone or solid oak, winding round a large newel, and without any nosing; the handrail was cut out of the material of the wall and flush with it, but in the inferior staircases no handrail was provided. The octagon tower in the elevation, fig. 1646, is a staircase of the above description from the basement to the upper story; the large open staircase serving only to ascend from the ground to the rooms on the first floor. Fig. 1650 is an elevation of the hall chimney-piece and grate. Fig. 1651 shows part of the ceiling of the library. Ceilings, during the time of Henry VII. and throughout the whole period when Tudor Architecture prevailed in the houses of the nobility and gentry of England, extending to near the middle of the reign of Queen Elizabeth, were generally divided into compartments, with moulded ribs, and elaborately carved bosses at their junction, the hollow mouldings frequently charged with various ornaments at certain distances from each other; or with continued foliage; the panels were often painted blue, and studded with gold stars, or emblazoned with the family arms. Some of the mouldings and ornaments were gilt, and others painted in rich colours; leaves and flowers were often represented with their natural tints; expensive modes of decoration, but rich in their effects. Fig. 1649 is a plan of the mouldings of the entrance-door jambs.

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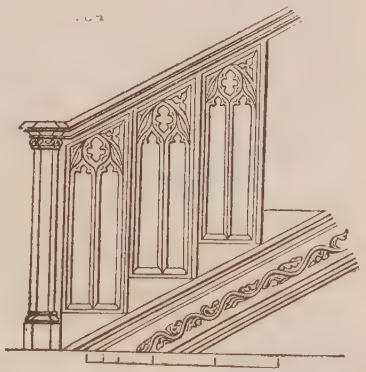
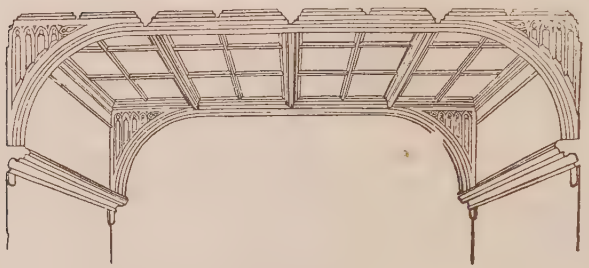
1649



1650

1910. *Remarks.* This Design has been contributed by Edward Buckton Lamb, Esq., the author of several preceding designs, and the reviser of that following. It displays a rich fund of knowledge of the details of the pointed style of Domestic Architecture; and is, taken altogether, a very original composition.

1651



Design XXIII. — *An Italian Villa on a considerable Scale.*

1911. *This Design* has been furnished by Robert Mallet, Esq., an amateur Architect of great taste, and by this time well known to our readers by the designs for iron furniture, and by various scientific contrivances, some of the more remarkable of which remain to be described. All the general masses, and the principal features of the interior arrangement, are the work of Mr. Mallet; but the architectural details and finishings are by E. B. Lamb, Esq., whose thorough knowledge of the Italian villa style is evinced by the details given as an appendage to this Design, and whose excellent taste in their display is conspicuous in his revision of Mr. Mallet's elevations.

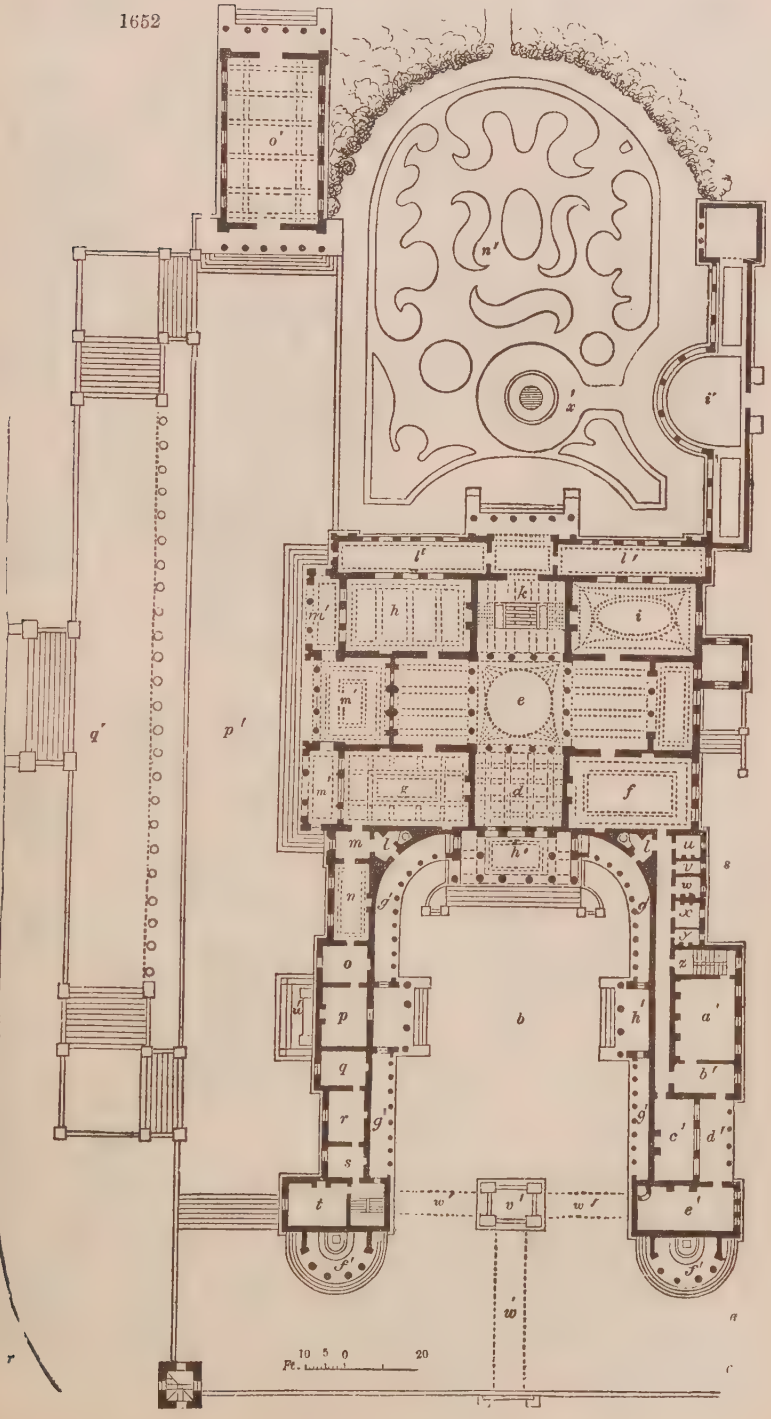
1912. *The Situation of this Villa*, Mr. Mallet observes, should be on a rather rapid declivity facing the south-east, so as to give ample scope for forming, at comparatively small expense, those magnificent terraces which vary and dignify the Architecture of the Palladian era. The upper part of the declivity is supposed to be covered with wood, terminating in hills, and the lower part should display garden scenery and pastures, terminating in orchards and hop-grounds, beyond which may be a fertile valley, watered by an ample river. There are many such situations in Scotland and Wales, and a number also in England, particularly in the lake district. If the Duke of Devonshire's villa at Chatsworth were to be rebuilt on the same site, something in the style of this Design would be suitable to the situation.

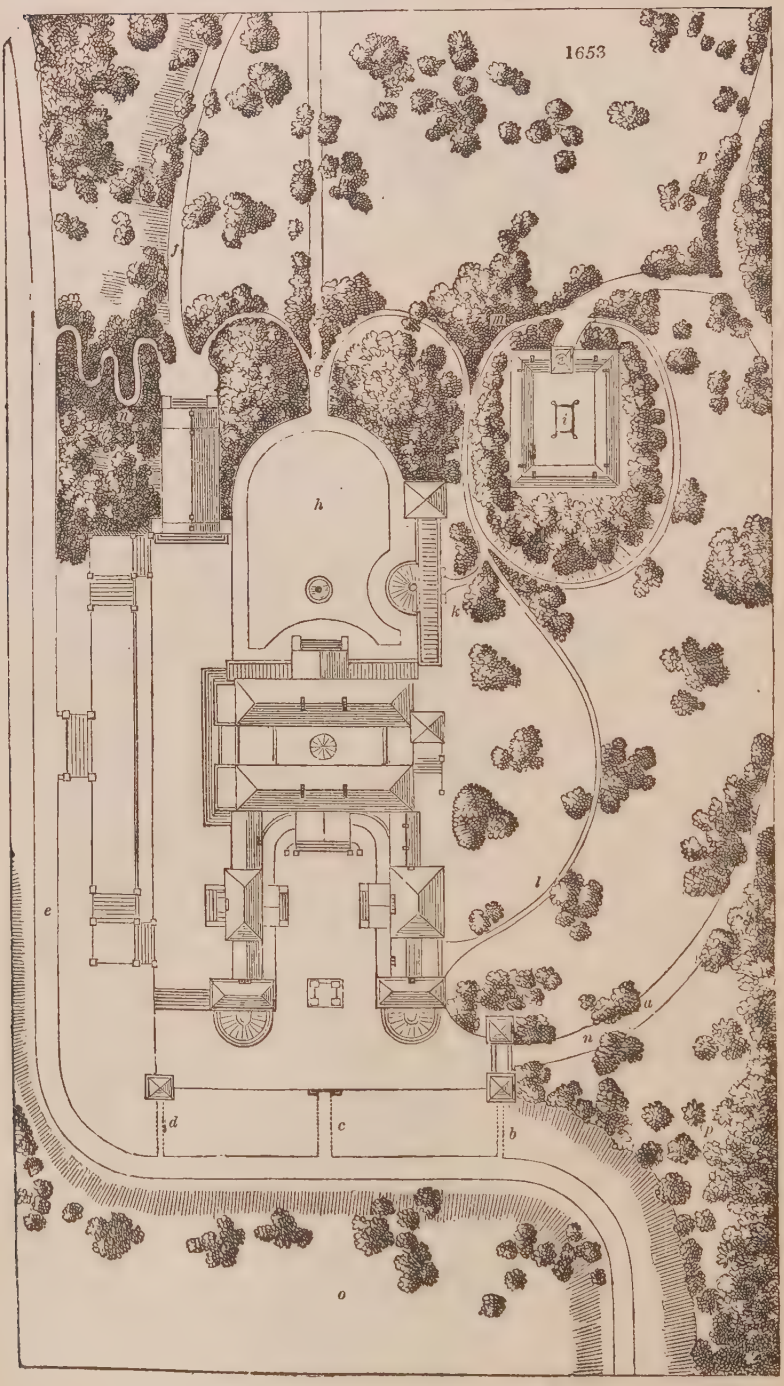
1913. *The General Appearance of this Villa* is shown in figs. 1658 to 1660.

1914. *This Villa should be lighted with Gas*, by burners placed outside the windows, with parabolic reflectors, as has been done in some places in England. The exterior effect in a dark night, I am informed, is magnificent beyond description. By these means the heat and smell of the gas in the rooms is avoided, and the light, coming from one side, like that of day, is much more natural and agreeable. As windows are the apertures through which natural light is admitted, nothing can be more appropriate than their employment for the admission of artificial light. The burners, and reflectors, &c., should, of course, be removed during the day.

1915. *Accommodation.* Fig. 1652 is the ground plan, in which *a* is the avenue or approach road; *b*, the entrance court, flagged with stones of irregular form, as in the streets of Florence and Pompeii, where the material is lava, here it might be granite; *c*, situation of the house-porter's lodge, shown in fig. 1653; *d*, hall; *e*, gallery of paintings, &c.; *f*, dining-room; *g*, drawingroom; *h*, library; *i*, breakfast-room; *k*, principal staircase; *l*, lobby and water-closet; *m*, ante-room; *n*, boudoir; *o*, ladies' private room; *p*, family bed-room; *q*, lady's maid's room; *r*, nursery; *s*, dressing-room; *t*, children's play-room; *u*, butler's pantry; *v*, plate-closet; *w*, pantry; *x*, housekeeper's room; *y*, dry larder; *z*, stairs from the basement to the offices on the ground floor; *a'*, kitchen lighted from the north; *b'*, scullery; *c'*, servants' hall; *d'*, covered passage from the scullery to the laundry; *e'*, laundry; *f' f'*, porticoes, or temples provided with terraced seats, and decorated with sculpture; *g' g'*, colonnades to the hall, &c., forming an uninterrupted covered way for servants; *h'*, portico; *i'*, conservatory; *k'*, aviary; *l'*, corridor; *m'*, portico; *n'*, parterre; *o'*, museum, ball-room, chapel, or billiard-room; *p'*, first terrace eight feet lower than the entrance court, *b*; *q'*, second terrace fifteen feet lower than the first, with a covered colonnade for walking under in wet weather; *r'*, third terrace, with a carriage approach, laid in grass; *s'*, grass lawn; *t'*, situation of stables, shown in fig. 1653; *u'*, terrace seats; *v'*, open area to light and ventilate the passages to the offices; *w'*, these passages; and *x'*, fountain. The chamber plan may be easily conceived.

1652




1653
p
f
m
g
i
h
k
l
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n
d
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o

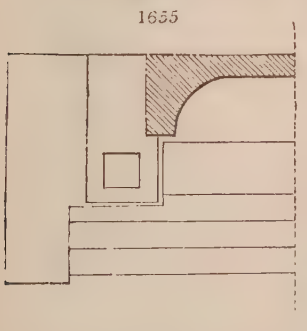
Fig. 1653 is a vertical profile, showing the connection of the buildings with the roads, walks, and scenery; in which *a* is the principal approach; *b*, an entrance to the lower part of the porter's tower; *c*, entrance for servants to the basement story; *d*, private entrance to the staircase in the tower; *e*, carriage road, serving as a private approach to the garden front, and forming, at the same time, part of a drive through the estate; *f*, carriage road to the museum; *g*, walks leading to the flower-garden, *h*; *i*, stable court; *k*, back entrance to the hot-houses; *l*, *m*, walk connecting the kitchen with the stable court; *n*, walk descending a steep bank, forming a private entrance to the museum; *o*, sloping surface, forming part of the park; and *p*, steep wooded banks, connecting the park with rising hills.

1916. *Construction.* All the walls may be of brick, covered with cement, and the roof may be covered with Italian or Grecian tiles. The building may be rendered fire-proof by brick arches, abutting on cast-iron girders; or by joists of timber, with floors of large slates or tiles laid in cement, and covered with mastic (a cement formed of powdered stone, mixed with oxide of lead and oils); the slates or mastic may be painted either in imitation of mosaic pavement, of oak or other timber, or of carpeting. In Italy, fire-proof floors are often formed of what is called composto (composition), in the following manner: — The joists of the floor are first covered with coarse boards, and afterwards with a layer of straw, though the boards are frequently omitted, more especially when reeds can be substituted for the straw. On the straw is spread a layer of common mortar, and on this a stratum of from one to three inches in thickness of ter razza (terrass, a compound of powdered brick and lime). The terrass is well beaten

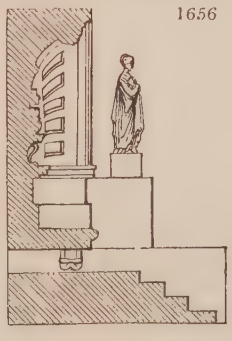
1654

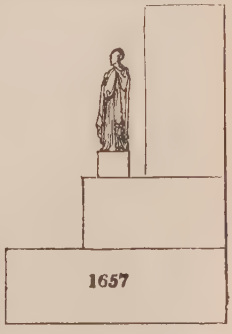
afterwards rolled smooth with a heavy roller, and, finally, polished with sandstone. When it is desired to imitate a marble floor, fragments of marble of different colours, and all reduced to equal sizes, that is, about the sixteenth of an inch in diameter, are spread on the terrass before it is dry, in regular patterns, by the same process as that employed in stencilling, and these are first beaten down, afterwards rolled, next polished, and finally lines are drawn round the different forms, and filled in with lampblack and oil. The result, when properly done, is a very successful imitation of different-coloured

1655



1656



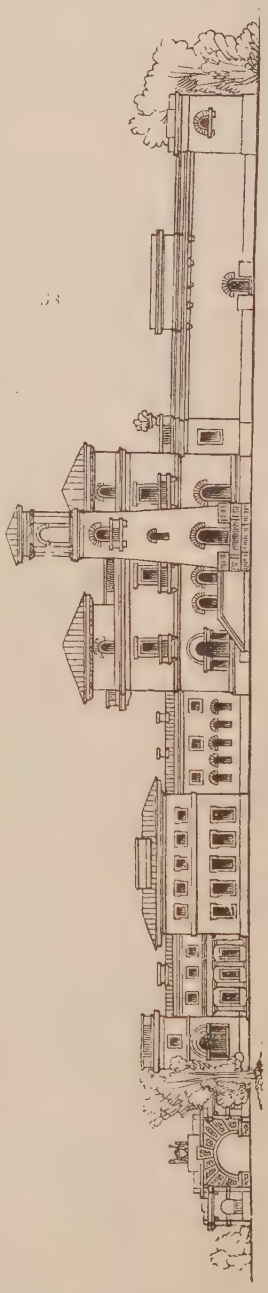


1657

marbles. Such floors are common in Genoa and Venice. (See *Quatremere de Quincy Dictionnaire Historique d'Architecture*, art. *Composto*; and *Borgnis, Traité Elémentaire de*

Construction, &c. p. 234. The terrace seats, *u'*, may be formed as shown in fig. 1655: the elevation is shown in fig. 1654; the section in fig. 1656; and the end view in fig. 1657.

1917. *Remarks.* "The great scarp, or upright wall of the terrace on the entrance front," Mr. Mallet observes, "with its two flanking towers, would be imposing; and the building intended as a museum or ball-room at the extreme end of the upper terrace would have a fine effect, as would the long colonnade with its covered walk. Coal-vaults, cellaring, &c., may be made, communicating with the underground passage to the kitchen; and the upper terrace might also be vaulted, if that were desirable. It is to be remembered, that a villa is generally to be considered as a summer residence, and that, therefore, open passages, and the generally open style of Italian construction, are not only admissible, but characteristic. There are some minor apartments and offices, which have no place in this Design, which, however, may be placed under the main court or terrace, and lighted from a range of windows in the grand or entrance front scarp. The other terrace might also be made subservient to the same end, and lighted in the same manner. The long and lofty range of Palladian windows that would thus become requisite would have a magnificent effect. Fireplaces are still retained in this Design; because, although, as they are commonly constructed, they are the very worst manner of heating a room, habit has rendered them necessary to our comfort. To prevent the draught of air to the backs of those who sit near the fire, air tubes from the exterior of the house, with openings under the ash-pan of the grate, and ventilators covering them, should be provided to each fireplace. These tubes might have cocks to regulate the admission of air; and thus, by increasing or diminishing the draught up the chimney from the air of the room, to regulate its temperature at pleasure. In addition to these advantages, air so admitted would be an effectual preventive of smoky chimneys. The principal staircase in this Design is proposed to be heated by hot water from a boiler placed under the hall, and supplied with fuel, &c., from a short sunk passage, entering from beside the grand portico, and from its situation, hidden from view. Architectural pedestals in each room, placed where taste and convenience may dictate, would diffuse the heat throughout the apartments. Such pedestals," continues Mr. Mallet, "I have been and am constantly erecting. They are susceptible of much variety, and of a great display of beauty and rich ornament. They may be made in various forms; and one of the best of these, when it is applicable, is a series of concentric circles of plate iron, with alternate spaces between them for the heated air to pass through. Concentric cylinders thus formed are surrounded by a case, which may be rendered as ornamental as is deemed proper. Under no circumstances should pipes for circulating steam or hot water be admitted into dwelling-rooms; for I have uniformly observed that when these are introduced as skirtings, &c., they fail, from the walls absorbing most of the heat. The heat usually wasted at the back of the kitchen grate, in such a Design as the present, may be made sub-

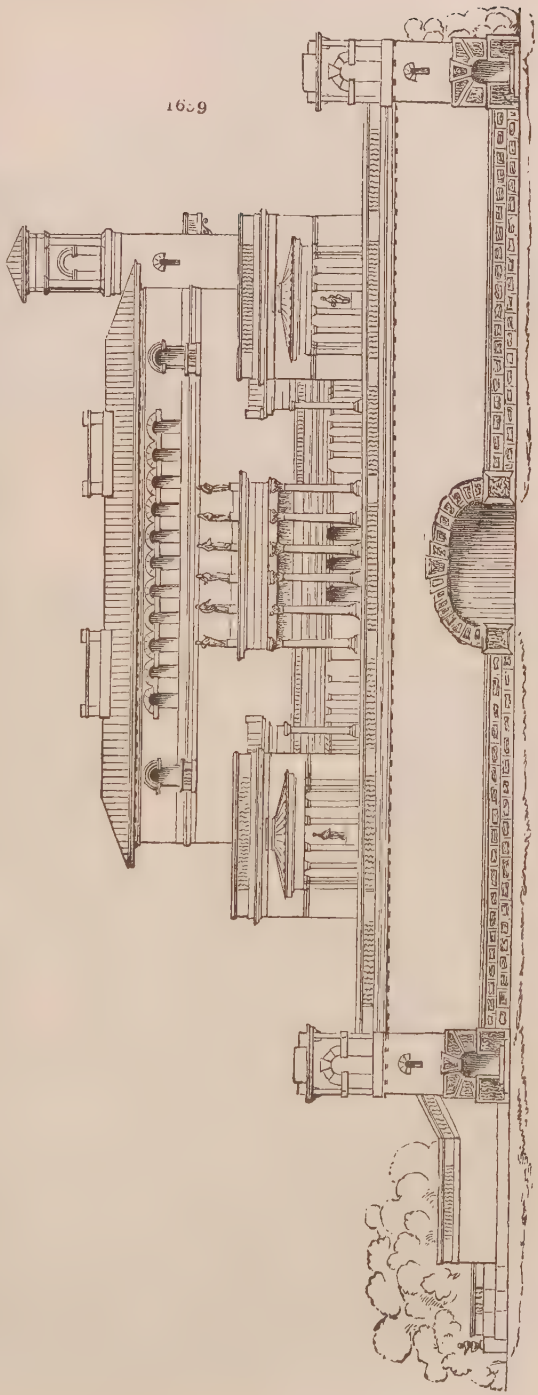


Elevation of the Approach Front.

servient to heating the whole of that wing; while a boiler fixed under the staircase in the other wing would heat the whole of that part of the house. Flat pipes will not stand pressure, and must be used with great caution at all times; for, as they are usually made, they abound in bad weldings, which are not discovered till, by the pressure, and consequent expansion, of the heated fluid, they burst or leak."

1918. *The following Observations on Italian Architecture* are chiefly by Mr. Lamb. The Architecture of modern Italy, in a general point of view, is of two distinct kinds; viz. that of the towns or cities, and that of the villas or country-houses. The Architecture of the cities is finely exemplified in the buildings of Rome and Florence, and is characterised by great simplicity in the general masses, and great distinctness in the details. We have only to refer to the street palaces of Rome, Florence, and Genoa, or to the successful imitation of this style, in all its simplicity and severity, in a palace, fig. 1661, just completed at Munich, by the king of Bavaria.

1919. *The Villa Architecture of Italy*, on the other hand, when on a large and magnificent scale, is either characterised by low horizontal forms, extending over considerable space, and symmetrical in the plan and elevation; or, when on a moderate scale, by scat-



1659

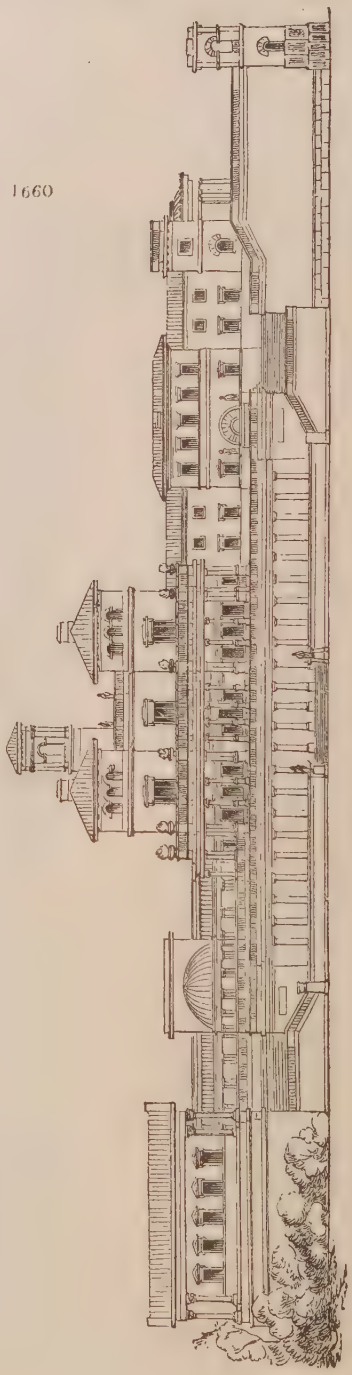
Elevation of the Entrance Front.

tered irregular masses, great contrasts of light and shade, broken and plain surfaces, and great variety of outline against the sky. The blank wall on which the eye reposes; the towering campanile, boldly contrasted with the horizontal line of roof only broken by a few straggling chimney tops; the row of equal-sized closely placed windows, contrasting with the plain space and single window of the projecting balcony; the prominent portico, the continued arcade, the terraces, and the variously formed and disposed out-buildings, all combine to form that picturesque whole which distinguishes the modern Italian villa from every other.

1920. *As an Example of a Villa of the regular Kind of Italian Villa Architecture*, we may refer to that lately built from the designs of the Italian Architect, Salucci, in the park of Rosenstein, near Stuttgardt, of which fig. 1664 is a general view; fig. 1663 the entrance front elevation; and fig. 1662 a ground plan. The general effect of this palace is simple and grand; and it is as admirably fitted for the country where there is abundance of space, and no occasion for piling one story over another, as the Tuscan palace of Munich is for the confined space of a city, where the repetition of one story over another becomes a necessary part of the design, and consequently a characteristic feature. The Rosenstein villa or palace affords a very good example of the internal arrangement of the principal apartments, common to Italy and the Continent generally One room communicates with another throughout every floor; differing only in size, and in the number of windows. There are no fireplaces shown, but stoves are placed in one or more of the angles of the rooms, according to their size. As these stoves are heated only once or twice a day, mornings and evenings, and as wood is the fuel used, little or no smoke is produced; and, therefore, there is the less occasion for conspicuous chimney tops, which could not have the same character of use as in a coal country, where the rooms are heated by open fires, and smoke is issuing from the chimneys during the whole of the day. In the ground plan, fig. 1662, *a* is the entrance hall; *b*, a grand hall for dining in on extraordinary occasions, lighted from the sides and from the roof, with galleries at each end for music; *c* is the principal saloon; *d d*, ascent for carriages to drive under the entrance portico; *e*, a flight of steps to the main entrance portico; *f*, steps to five other porticoes; and *g*, flights of steps to loggias or recesses, each with two columns and antæ.

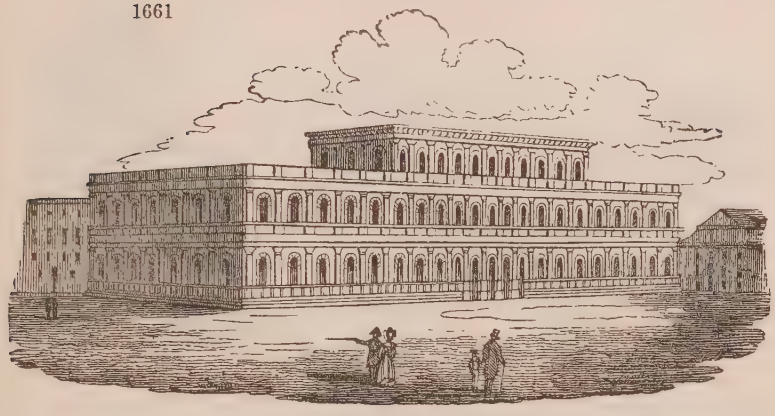
1921. *The irregular Italian Villa* may

1660



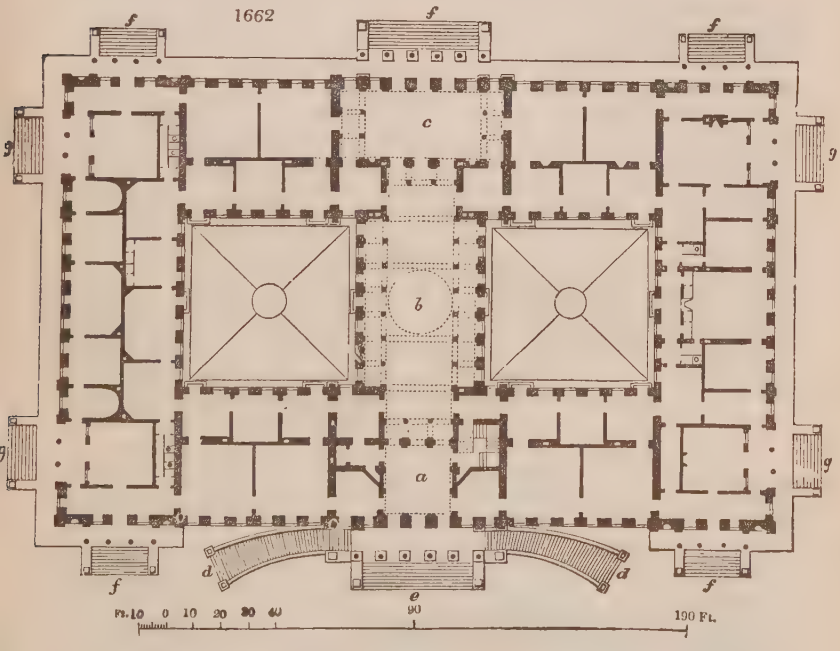
Elevation of the Terrace Front.

1661



be considered as admirably exemplified in Mr. Mallet's Design; and we may also produce, as a specimen on a large scale, the Villa Borghese, fig. 1665; and Petworth

1662



house at Arquà, fig. 1666, or Bel Respiro, fig. 1667, in the suburbs of Paris, as Italian villas of much smaller dimensions. This Italian style is readily distinguished from

1663

1664

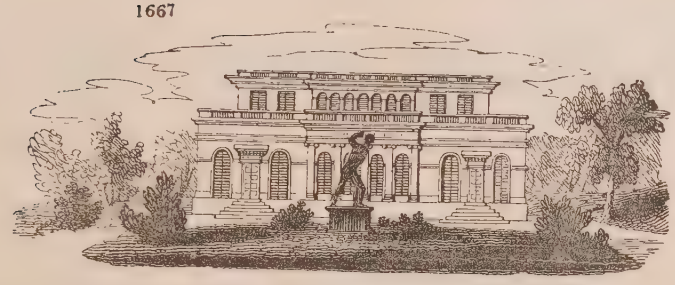
the French manner, on the one hand, with its high roofs, as exemplified in Voltaire's house at Ferney, fig. 1668; or the Swiss style, on the other, as exemplified in Silber-

1665

berg, near Stuttgardt, fig. 1669. It is unnecessary to produce examples of the modifications of the Italian and French villas adopted in Germany and Russia; or of the

1666

1667



more tame country-houses of Holland and the Netherlands, as neither of these can ever be mistaken for the Italian manner.

1668

1922. *The Details of the Italian Style of Architecture* include roofing tiles, wall stones, chimney tops, brackets, cornices, window-dressings, doors, turrets, and porches.

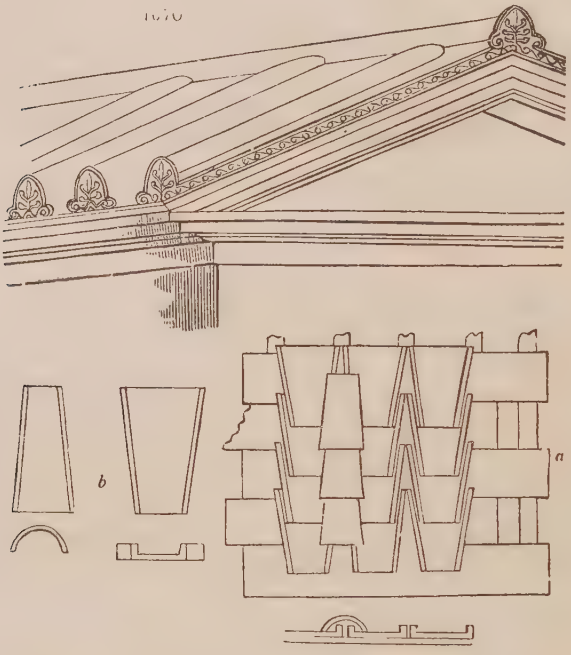
1669

Statues, urns, and other such picturesque objects belong to external ornament or finishing, and will be noticed in a subsequent chapter.

1923. *Roofing Tiles.* Much of the beauty of small Italian villas depends on the marked character arising from the forms of the tiles employed to cover them. We have

already given several of these (see list of engravings, art. Tiles), and shall here add two other modes.

1924. *A Mode of Tiling* adopted by the ancients, and of which there are specimens still to be found in Rome, is thus described by Borgnis (*Traité de Construction*, p. 253.):— Fig. 1670 *a* is a dissected view of a portion of a roof covered in the manner alluded to;

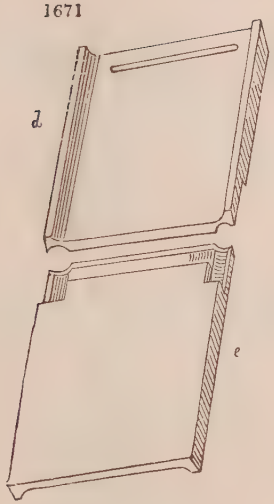


and *b* shows plans and sections of the separate tiles. The flat tile, with the turned-up margins, is two feet long, and twenty inches wide at the broadest end; and the hollow semicylindrical or bridge tiles are eight inches in diameter at their widest end. The flat tiles were laid in mortar, either on brickwork, masonry, or boards, as the case might be; and ornamental tiles were placed at the eaves, somewhat in the manner shown in the following mode of tiling. It is to be observed, that, by having the tiles both flat and semicylindrical, broader at one end than at the other, they are made to dovetail into each other in such a manner that no nails are required to keep them in their places, provided the tiles of the eaves and of the ridge of the roof are securely fixed by mortar or cement.

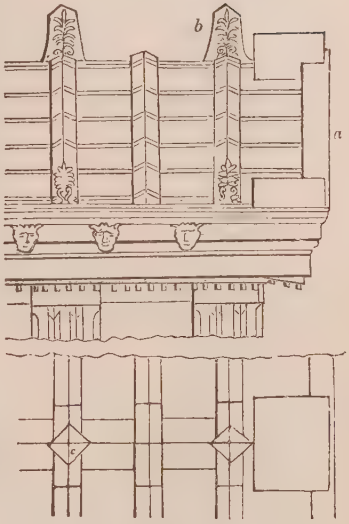
1925. *The Mode of Tiling exhibited in the Temple of Diana Propylæa* is given in the engravings of that temple in the *Unedited Antiquities of Attica*. Fig. 1672 *a* is an elevation of part of a roof of the temple, in which the crocket-like ridge tiles are shown at *b*, and their vertical profile at *c*. Fig. 1671 *d* is the upper surface of one of the flat tiles, and *e* its under surface. Fig. 1673 shows a perspective view of one of the bridge tiles, *f*, and a longitudinal section through the same, *g*. The effect of these tiles is remarkably good, and imitations of them might be introduced in villas and cottages with excellent effect.

1926. *The Kind of Face of the Stones, and the Manner in which they are disposed in Courses in Italian Buildings*, often form a source of great beauty. In England, whenever the surface of a wall is otherwise than smooth, it is said to be rusticated; but the varieties in common use are so few, that they have not received designations as in France and Italy. The rocky surface, the stalactited, the vermiculated, and the punctured, are among the kinds used by the Italians; and the divisions between the stones are either triangular in the section, curved, square, or composed of modifications of these. In fig. 1674, *a* is a vermiculated surface; *b*, a surface cut

1671



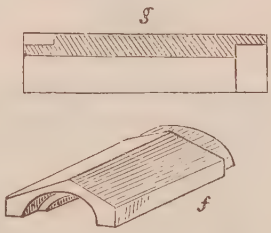
1672



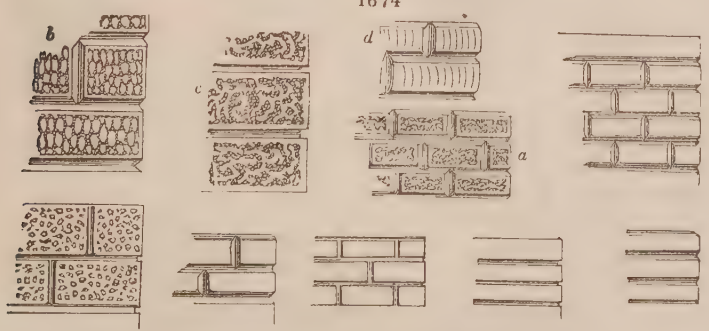
in imitation of stalactites; *c*, a surface punctured in imitation of rude rock; and *d*, a convex surface.

1927. *Chimney tops* are features of considerable importance, more especially in the irregular villas of the north of Italy. That eminent artist, Williams, has selected six: of which fig. 1675 is from Rome; fig. 1676 is from Lucca; fig. 1677 from Perugia; fig. 1678 from Florence; fig. 1679 from Zante; and fig. 1680 from Corfu. Fig. 1681 shows four common forms; of which *e* is the most complicated. Fig. 1682 is a large chimney top containing several flues, covered at their terminations with Italian tiles. It must be observed, that, as wood is the common fuel in Italy, the flues in the chimney shafts are much smaller than in Britain, as the

1673



1674



smoke of wood ascends in far less space than that of coal, and produces very little soot. Great care is requisite in distributing chimney tops, so that, when viewed in perspective, they may form groups; and, while they break the general outline of the roof, may not fritter it into small parts on the one hand; or, on the other, assume so much importance as to render other parts insignificant.

1675

1676

1677

1928. *Brackets and Cornices* are striking features in Italian buildings. In fig. 1683, *a* and *b* are the details of brackets which may be executed in wood, such forms being

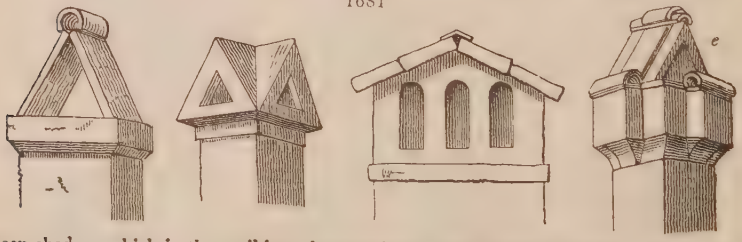
1678

1679

1680

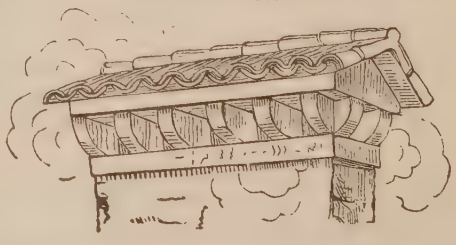
common both in Italy and Lorraine; *c* is a cantilever cornice, which may be executed either in wood or stone. The great projection of the corona or upper part produces the

1681



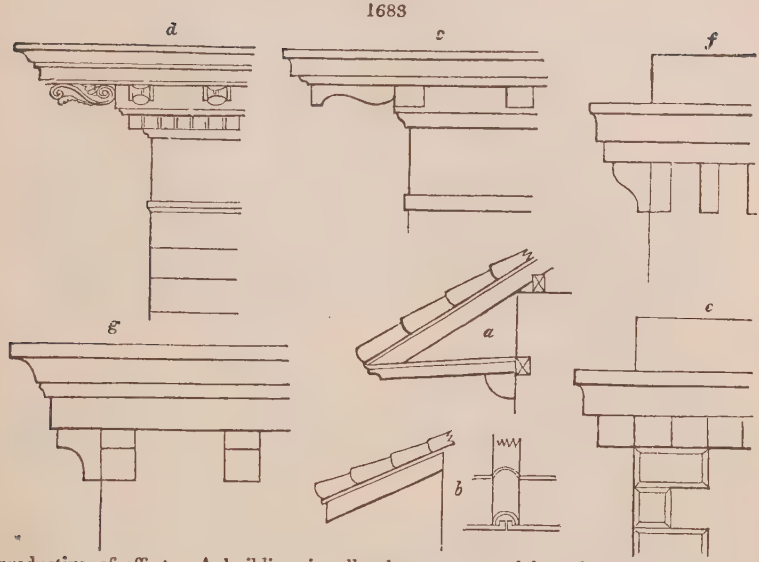
deep shadow, which is the striking characteristic of the Italian cornice. An enriched modillion with rustic coins is shown at *d*, and is a common feature in the better description of Italian villas, and also in the street palaces of Rome and Florence. Of block cornices, such as *e*, *f*, *g*, there is a great variety, many of which might be executed with common bricks. Such cornices are often introduced as string courses, or horizontal belts or bands in the walls of buildings, and also so as to serve for the sills of windows. Frequently they are made use of as a finish to the terrace or parapet walls of a villa.

1682



Few features of the Italian style are less expensive, more generally applicable, or more

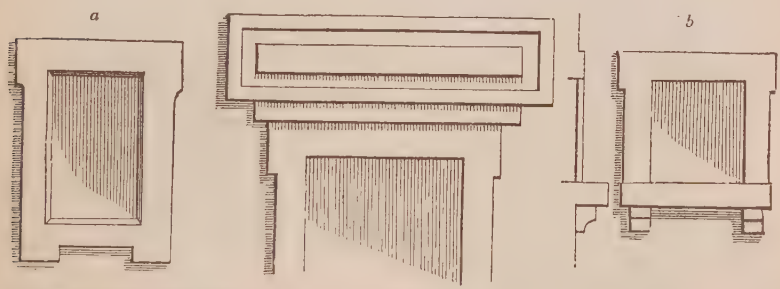
1683



productive of effect. A building in all other respects plain, with rusticated coins, and a blocking cornice, such as *e*, with similar cornices under the window sills, will produce a striking effect, without any other exterior decoration.

1929. *Window Dressings* are fine sources of character. In fig. 1684, *a* and *b* are the

1684



plainest forms in general use; and, when properly and not too profusely introduced in an elevation, their effect is excellent. Palladio occasionally uses the form *c*. In fig. 1685, *d* is a specimen of a circular-headed window with a balcony. Balconies are used by the Italians in most situations; and they are most desirable objects, not only for their individual beauty, and their architectural effect, but as places for displaying flowers; and, as a writer in the *Mechanics' Magazine* has observed, as places to go out on in case of fire, when there are no means of internal descent. The straight-headed window, *e*, in this figure is highly architectural, and is well fitted for a rustic basement.

1685

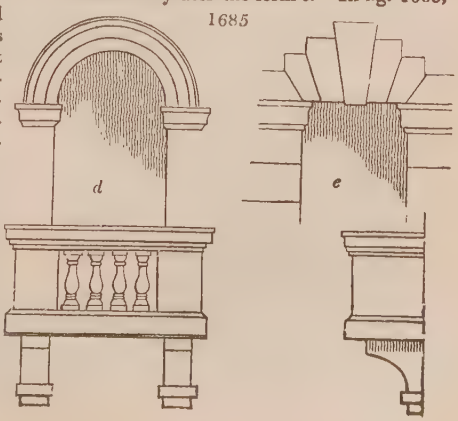
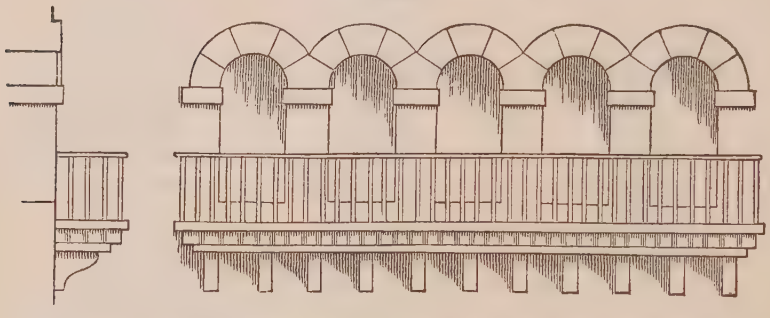


Fig. 1686 is a row of circular-headed windows, with a balcony, which forms one of the most striking features in the elevations of Italian villas. It

1686

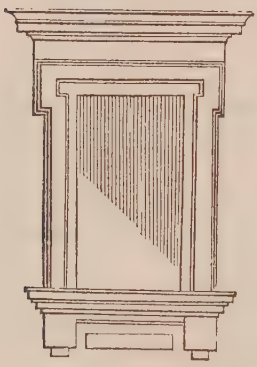


will be observed that the effect is produced chiefly by the contiguity of the windows, and the repetition of parts of the very simplest description. Few features in any style are calculated to produce so much effect, at so little expense. An arch is always expressive of strength, more particularly when it is semicircular; and the cooperation of these arches, in this instance, is an idea at once simple and grand. In this as in many other features of Italian Architecture, we see combined the science of the Architect and the knowledge of effect of the painter.

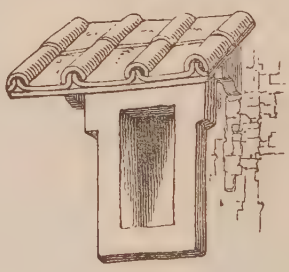
Fig. 1687 is a window-head with an architrave, and a moulded sill supported by blocks.

Fig. 1688 is a window with a plain facing, supposed to be placed in a projection from a plain wall, and protected by a pent-roof of tiles.

1687

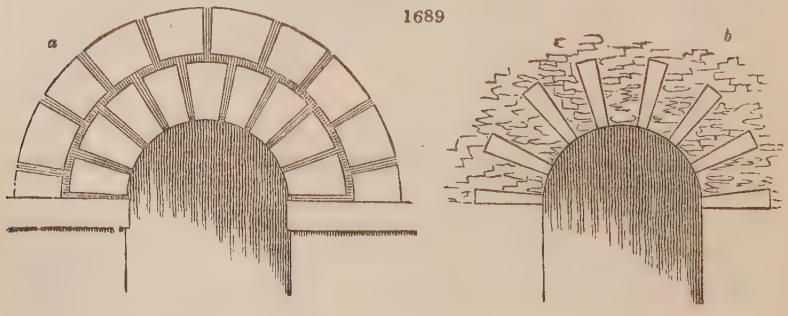


1688



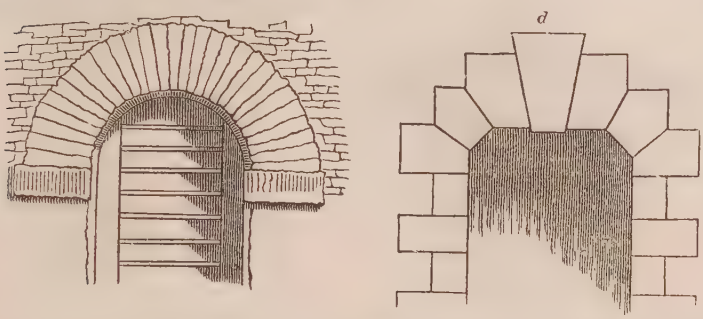
1930. *Doors*, in all styles of Architecture, are fertile sources of character and ornament. In fig. 1689, *b* is a doorway constructed with tiles and rubble-work, and displays,

1689



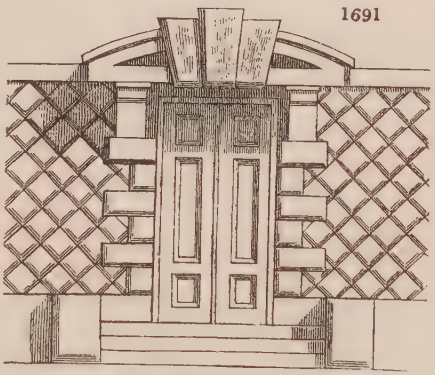
perhaps, the very cheapest mode of forming a semicircular arch. The use of the tiles is in preserving the rubble from being thrust out of form; while they confer, at the same time, an architectural character. The door, *b*, in this figure shows a double arch of rustic work. In fig. 1690, *d* is a door-head of rustic work of a peculiar description,

1690



having the angles cut off; and *c* is a door-head, supposed to be constructed of rough stone, in which also is shown part of the door. Fig. 1691 is a doorway with a projecting head and rustic jambs, which shows also part of the wall, built of diagonal masonry.

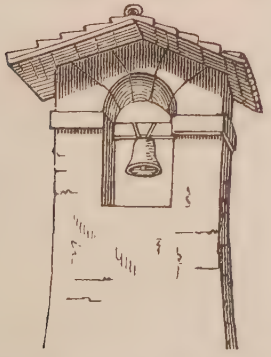
1691

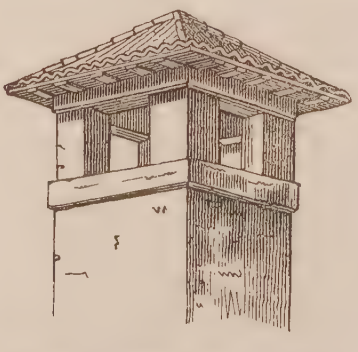


1931. *Bell Turrets* assume various forms. Fig. 1692 is one of the simplest, being the mere continuation of a wall, commonly a gable end, or the termination of any division wall, carried a few yards above the roof. Figs. 1693 and 1694 are forms of watch-towers, common on the smaller villas, and even farm-houses, in several parts of Tuscany. Fig. 1695 is a campanile or watch-tower of a highly architectural character, which is calculated to produce an excellent effect.

1932. *Porches* suited to the Italian manner are exemplified in figs. 1696, 1697, and 1698, which are from the portfolio of Marriott Field, Esq., a young Architect, lately returned from a professional tour through Italy. In many of the smaller Italian villas, instead of pro-

1692





1693

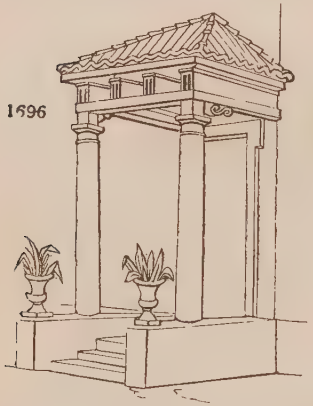
jecting porches, the entrance is formed within a recess, which has columns or an arcade in front. In others, instead of a portico, porch, or recess, a projecting colonnade, arcade, or veranda, extends the whole length of the entrance front, and the principal

1694

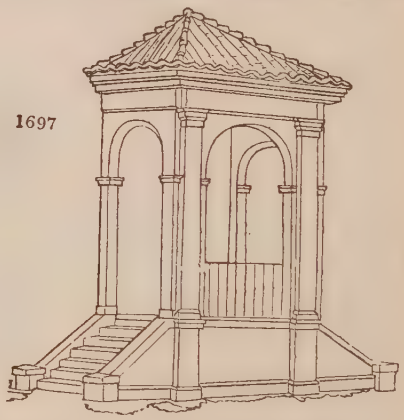
1695

doorway may be under any part of it. In most large villas the entrance doorway is either protected by a portico that may be driven under, or it is formed on the side

1696

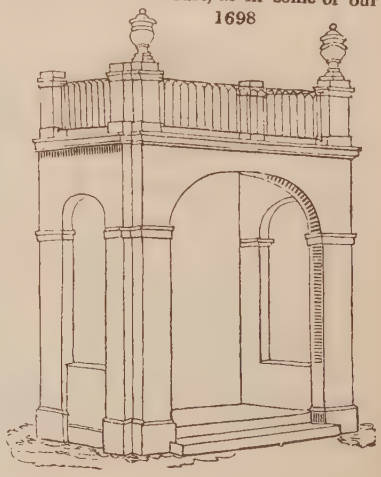


1697



of an archway through which carriages drive into an inner court, as in some of our public inns. This is a comfortable contrivance, but by no means an elegant one. In the first place, it indicates want of space; and, next, want of means for display and decoration; lastly, such entrances are always gloomy.

1698



1933. *The modern Italian Style of Architecture*, the characteristics of which may be given in two words — painter-like effect, — has in this country the recommendation of novelty; a quality which always makes a strong impression on the general observer. It is not, however, a style which can be trusted in the hands of any Architect not a master in the art of composition. The great object, in designing every building, as far as exterior effect is concerned, is the production of a whole: now, in regular symmetrical Architecture, this is comparatively easy; for, a centre being fixed upon, the two sides can easily be made to correspond with it. A beautiful design may not be

the result, but, whatever it may be, it will have pretensions to being a whole. Italian Architecture, on the other hand, is characterised by irregularity, by strong contrasts, and by other painter-like effects. The whole, which is the result of this style, is of a more refined kind; it is addressed to a more highly cultivated taste; and to produce it requires a much higher degree of talent, than to compose in any species of regular Architecture. No Architect, therefore, ought to attempt the Italian style, who has not studied the composition of landscape scenery generally. If we were to look out for a young Architect to design an edifice in the Italian style we should first show him a landscape, and ask him to analyse it; and next we should show him a view of an Italian building, and ask him to point out the causes of its beauty. From the Design before us, and the excellent illustrations of the details of Italian Architecture which accompany it, it will be evident to our readers that Mr. Lamb is an artist of first-rate merit in this style. One great recommendation of the Italian manner in our eyes is, that, from the cheap nature of its finishing and decorations, it is suited to a people in moderate circumstances — to a democracy. Another is, that, from the irregularity of its masses, which admit of a house receiving additions in every direction, it is suited to a prosperous and improving people, — such as the Americans.

Chap. IV.

Designs for Appendages to Villas.

1934. *All the Architectural Appendages of a Villa* should obviously partake of the character of the house; not only in point of general effect, but in proportionate dimensions, and in architectural style. This is a leading principle; to which, however, there may sometimes be exceptions, arising from local circumstances. For example, we see no sufficient reason for laying it down as an absolute rule, that a Grecian or a Gothic villa should never have a simple cottage for a lodge; as situations and circumstances may occur where such a deviation from the usual practice may become desirable. Neither do we see why a Gothic house should have no bridges but what have pointed arches; that form being, in flat situations, unsuitable for a bridge, on account of the rise it requires in the road over it. Unity of architectural style with the house is, however, essential in all those buildings which are in its immediate vicinity; or where they are seen before a view is obtained of the house, and where a marked and different style would create false expectations in the spectator as to that of the principal object. In garden buildings, which are presented as specimens of Architecture, of course all styles may be admitted, because the whole there may be considered as an architectural museum. We shall submit a few designs for, and observations upon, stables, riding-houses, dog-kennels, ornamental dairies and poultry-houses, aviaries and menageries, architectural conservatories, terraces, parapets and other mural ornaments, ornamental garden buildings, and entrance lodges and gates.

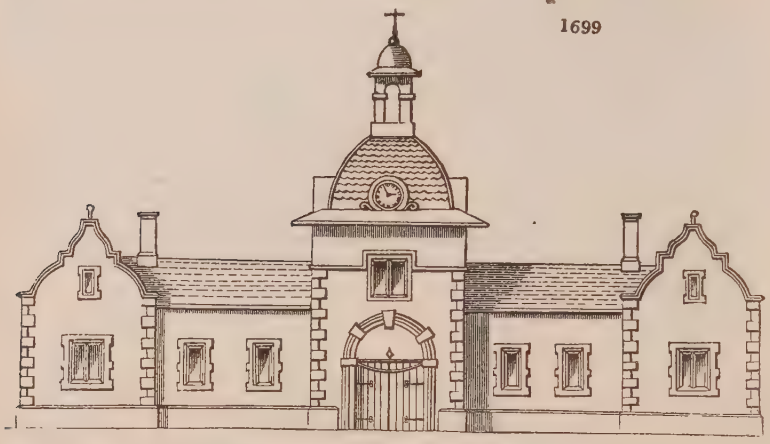
Sect. I. *Stable Offices.*

1935. *The Situation of the Stable Offices* of a villa, and various other particulars respecting them, have already been noticed in the first and second chapters of this Book; and we shall, therefore, confine ourselves, in the present section, to describing one or two designs.

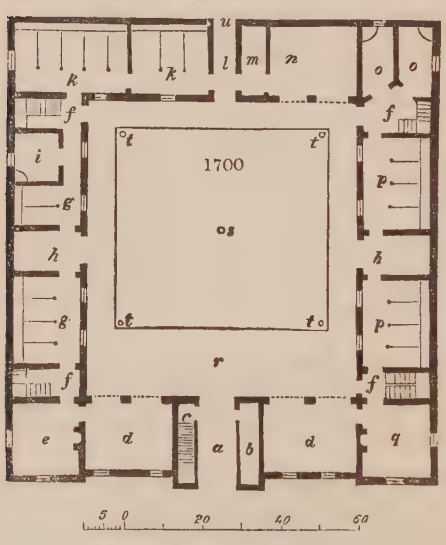
1936. *Stable Offices for Beau Idéal Villa.* Fig. 1699 is the elevation of the stables intended for Beau Idéal Villa, as contributed by Selim, and revised by Charles Barry, Esq.; and fig. 1700 is the ground plan, which is supposed by Selim to contain adequate accommodation for the horses and carriages, &c., of the occupant of such a house. (See § 1715 to § 1720.) — All the manure from these stables is wheeled every morning into the dung-yard, *a*, and thrown into a large pit, where it remains till taken away for hot-beds by the gardener; the walls of the melon ground forming the N.E. boundary of the dung yard. The liquid manure from all the stables is conducted through drains to a tank, from which it may be pumped up into barrels, and conveyed to the farm. Stacks of wood for fuel, stacks of litter, and various articles for the gardens, stables, and kitchen court, may also be placed here. Over all the stables and coach-houses are lofts for containing hay, drawn straw for litter, and corn; with close-jointed floors, so as to prevent the dust from dropping through on the horses. The corn is let down by a funnel, fig. 1701, *a*, connected with a square tube or shoot, *b*; this shoot has two sliding stoppers, the handles of which are seen at *c* and *d*; and the space between the slides being adjusted so as to hold a feed, any quantity is readily measured out. When this is done,

the lower slide is locked up by the head stable-keeper. The general construction of these stables should correspond with that of the house; the Architecture displaying the

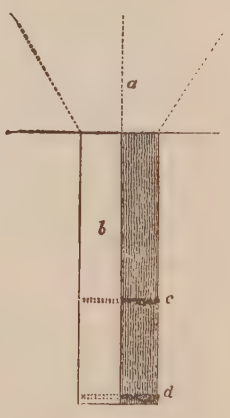
1699



same character of ornament, though in an inferior degree. In fig. 1700, *a* is the entrance, with a clock-room and bed-room over it: over the clock-room is a turret-bell, the rope for ringing which hangs down in the closet, *b*; *c*, staircase; *d d*, coach-houses, each



1701

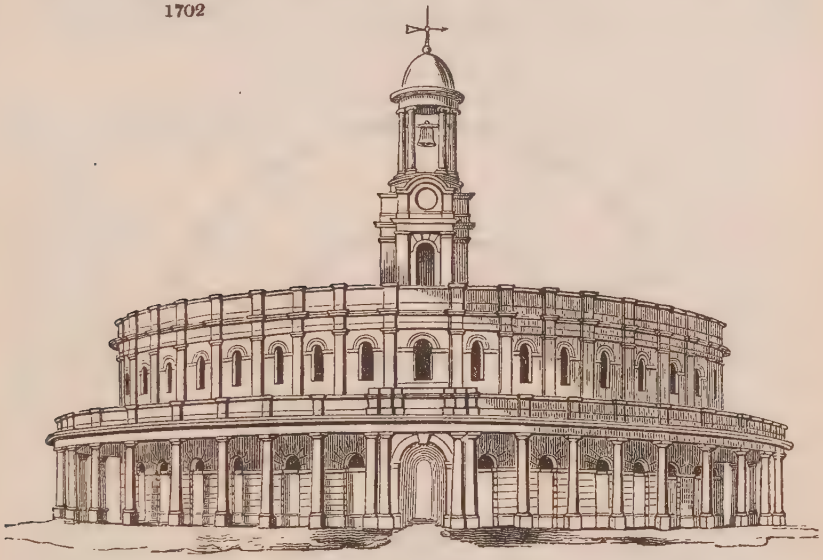


with a stove; *e*, harness-room, also with a stove; *f f f f*, staircases to the lofts; *g g*, coach-horse stables; *h h*, lobbies open to the yard to clean horses in, also for the carriages of visiters to back into in wet weather; *i*, sick-horse box; *k k*, stabling for the horses of strangers; *l*, passage through to the back yard, where the dung is placed; *m*, harness-room to the coach-house, *n*, for strangers; *o o*, boxes for hunters; *p p*, saddle-horse stables; *q*, saddle-room, with stove; *r*, broad pavement in front of the coach-houses; *s*, pump and trough, with large lamp over; *t t t t*, sinks for carrying off the surface-water; *u*, dung-yard.

1937. *Circular Stables.* Fig. 1704 is the ground plan, and figs. 1702 and 1703 are suitable elevations of a building containing extensive stabling, coach-houses, and other accommodations of the stable-yard, with a yard in the centre for young horses to run loose in occasionally. This yard contains an open building for covering a hayrick, a pump, and hay-racks. Over the stables, &c., are lofts for hay, corn, &c., and

billiard-room. The ground plan of these stables was designed by us, in 1809, for the late Colonel Mytton of Garth, Montgomeryshire; and it is proper to observe that a

1702



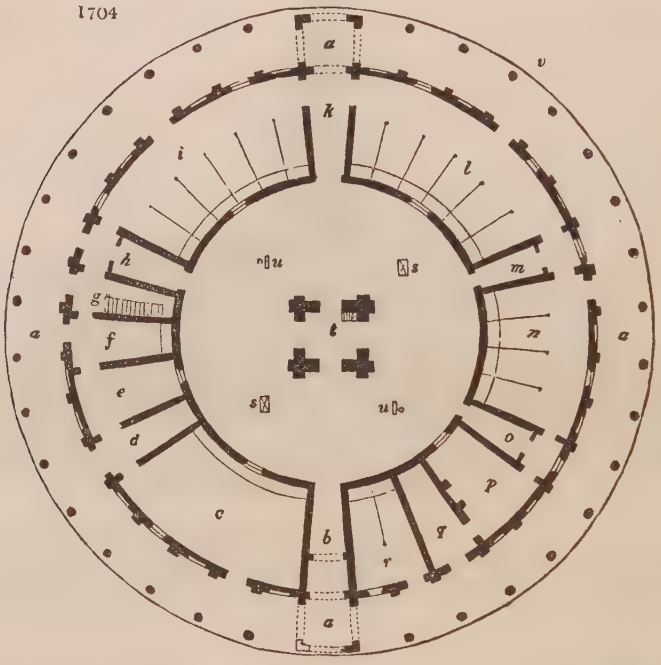
principal object in view was, to provide accommodation for breeding and breaking in a superior description of riding-horses. The situation on which these stables were placed was the summit of an elevated knoll, protruding from the side of a hill; and their effect was remarkably good from all the surrounding country. The elevation actually executed

1703

from our Design was different from either of those now given, and, we need not say, much inferior; the latter having been suggested and sketched for us by Mr. Barry, and prepared for the engraver by Mr. Lamb. Fig. 1702 is in the Italian style, and fig. 1703 is in the Tudor Gothic. The plan in the last case, being a polygon of as many sides as the plan for the Italian elevation has intercolumniations. In both elevations the roofs are concealed, because they are considered to be flat, and covered with lead or

tiles laid in cement, in the manner known about London as terrace roofs. The reasons for omitting the roofs as features in the Design are, that the building may have a more imposing and architectural character, and that the great expense of constructing circular sloping roofs to be both sightly and weather-proof, which can only be effectually done by using tiles made on purpose, might be avoided. The following are the details of the

1704



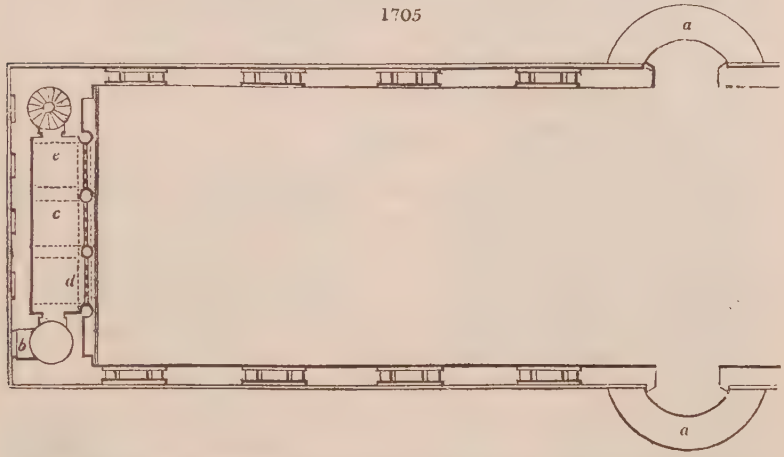
ground plan: — *a*, veranda for exercising horses, or for riding or driving under during rainy weather, being ten feet wide in the clear, fifteen feet high, and nearly two hundred feet long; *b*, gateway to the inner court; *c*, stable for farming horses; *d*, coach-house; *e*, harness-room, with fireplace; *f*, stall for a single horse; *g*, stair to a billiard-room over *d*, *e*, and *f*; *h*, hay-bin; *i*, saddle-horse stable; *k*, entrance to the stable and central court; *l*, stable for hunters; *m*, hay-bin; *n*, stable for coach-horses; *o*, hay-bin; *p*, harness-room with stove; *q*, coach-house; *r*, two-stall stable; *s s*, hay-racks for horses running loose in the inner court; *t*, Dutch barn, covering a hayrick; *u*, pumps and troughs for supplying water; *v*, situation of a cesspool, in which all the liquid manure of the stables is collected, and from which it is conveyed by an underground drain to another cesspool, where it is preserved till wanted for use. The dung-pit is at some distance, walled in, and covered by a roof.

Sect. II. *Riding-houses.*

1938. *A Riding-house*, it is observed by our correspondent Selim, § 1716, is a luxury not often wanted in villas of moderate size; and we shall, therefore, only notice the subject briefly. The form of a riding-house is generally that of a parallelogram; though that at Brighton, some in London, and the veranda at Garth, as well as others in different parts of the country, are circular. When the latter form is adopted, the diameter should not be much less than one hundred feet; the centre of the circle may contain one or more columns, or a tower for the support of the roof, though it is more convenient, for the exercise of horsemanship, to construct the roof without any supports from the ground. A parallelogram riding-house cannot well be less than one hundred feet long, and forty feet broad; but riding-houses of this shape are generally built of larger dimensions. In general, at the ends of a parallelogram riding-house there are small galleries, and seats for spectators; and in circular riding-houses the galleries are placed round a single column, or within a circle of columns, in the centre of the structure.

When a tower is used as a central support, it may have a staircase and balconies round it. To show how these galleries are placed in a parallelogram house, we shall here give a portion of the plan of the manege of Monaco, built for the king of Sardinia, by the late Architect Quarenghi, from a drawing given to us by him, in St. Petersburgh, in 1814. Fig. 1705 is half the ground plan, in which *a* is the inclined plane to the door

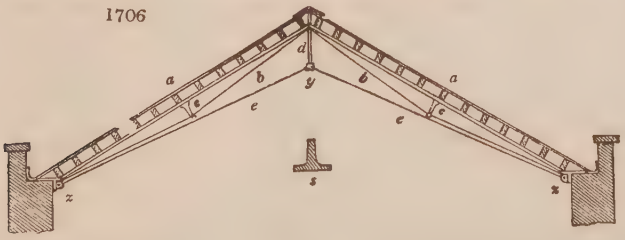
1705



by which the horses are taken in, and *b* the door for persons; *c* is the platform, on which those who are to ride wait till the horses are brought up to them; *d*, railings which open inwards; and *e*, a staircase to the gallery over. One of the finest elevations that could be employed for a building of this kind would be that of a Grecian temple, with open porticoes at each end, and the spaces, between the window openings, arranged as pilasters. Quarenghi's elevation was as bad as could well be imagined: the roof was hipped (almost always a negative fault) at the two ends; and pediments were raised on the sides, over the entrance doors for the horses. Quarenghi was any thing but an Architect of reason.

1939. *The Construction of the Roofs of Riding-houses* is the most expensive part of the edifice, as well as that requiring the most consideration from the Architect. The following communication on this subject, by Mr. Mallet, we present as particularly appropriate: — " For riding-houses, barns, large sheds, and other buildings requiring roofs of considerable space, I conceive a roof I have some time since invented the best I have seen. It is constructed partly of cast and wrought iron, and partly of wood; and may be finally covered with slates, copper, zinc, or any other material usually so applied. Fig. 1706 is a side view of one principal, or couple, of a roof for a riding-house, supposing

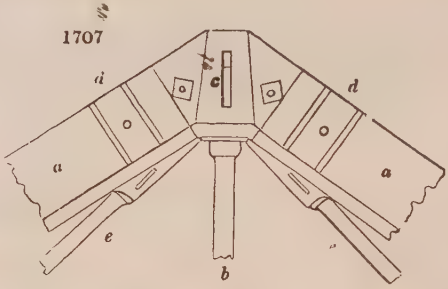
1706



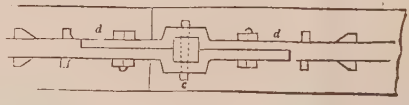
it to be from thirty feet to eighty feet span. The main ribs, *a a*, are of cast iron, in section as in *s*; and each is trussed by a round wrought-iron rod, *b b*, cottered into each end, and passed under the projection, or bracket, *c*. Thus, each principal rafter becomes trussed; and, at the meeting of the rafters above, a vertical bar, *d*, descends, and meets the two inclined rods, *e e*, which proceed from the lower extremities of the principal ribs or rafters, *z*. In this manner the whole system is resolved into two triangles, *d y z*; in which the sides *d y* and *z y* are subjected to tensile, and the side *d z* to compressing forces. Thus, the whole principal, or couple, is firmly trussed. Fig. 1707 is an enlarged view of the centre joint of the principal rafters; *a a* are the ribs; *b*, the vertical tension bar; and *c*, its cotter. The lap joint of the ribs is obvious at *d d*; *e e* are the

tension rods of the main ribs. Fig. 1708 is an edge view, or bird's-eye plan, of the same. Fig. 1709 shows the extreme lower terminations of the principal rafters; *o*, the rib; *p*, the lower end of the tension bar; *n*, the retaining pin passed through the projection attached to the rib; and *t*, the tension rod of the main rib. The cast-iron gutter inside the parapet, when a parapet is used, is also shown. When there is no parapet, any kind of eave-shoot may be employed. Fig. 1710 shows a side view of the main centre joint; *a* is a vertical rod; and *b b*, the main diagonal stays to the bottom of the main ribs. Fig. 1711 is a plan from the top of the same. The same letters refer to the same parts in both figures. This completes the details of the trussing; and I shall now show the application of the filling-in rafters.

1707

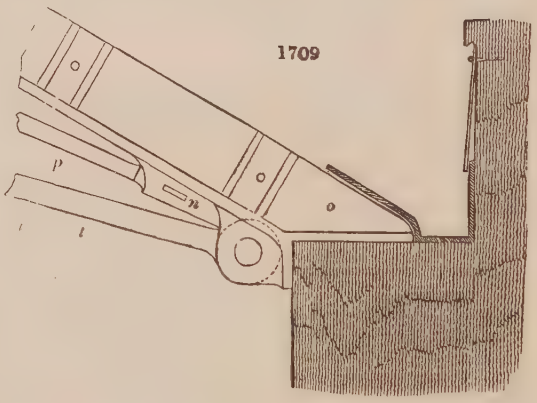


1708

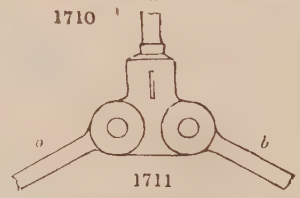


1940. *Application of the Filling-in Rafters.* Rafters are usually applied either lying parallel to the principals, or at right angles to them. In the first case, purlins are necessary; in the latter, each rafter is exposed to two strains (like a purlin); one vertically, and one parallel to the rake of the roof; and, as each rafter so placed is unaided by any other, they all soon swag. To remedy this defect, and save material, I propose placing my rafters diagonally; and, for this purpose, certain sockets are cast in the sides of the vertical part of the main ribs; which, when seen on edge, appear as in fig. 1712. The rafters are cut to the proper form, and driven into the sockets, *n n*. A hole is then bored right through both rafter ends, and through a hole cast in the iron, and an oak trenail or dowel (to keep the rafters from blowing off) is driven through, as shown by the dotted lines in the figure. The arrangement of the rafters is somewhat as in fig. 1713, supposing the centre couple, or principal, *a a*, to be that in the centre of the length of the roof. The rafters, being thus arranged, either stout laths for slating (sawn to two inches and a half by three quarters of an inch) are to be spiked down upon them; or they are to be sheeted over with thin boards, and covered with zinc or copper. Thus, it is seen, each rafter corroborates all the rest, both as regards the vertical and the diagonal strain; so that no one of these wooden rafters can either swag, or bend aside, without bringing others with it. By this means much timber is saved; moreover, all wall-plates, foot rafters, rafter-plates, purlins, &c., are dispensed with. The ends of the couples rest on stone, built into the walls. There is no waste of timber in cutting the rafters diagonally; as, when proper gauges are made, they will cut out of one another (by the property of the rectangle), like the

1709

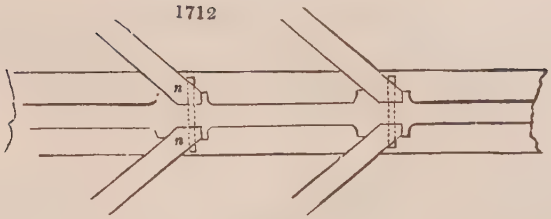


1710



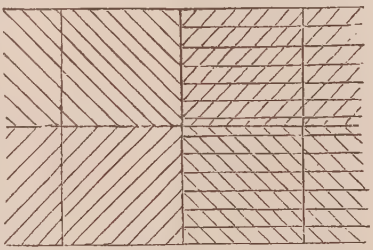
1711

1712



nipping of an ordinary roof. The ridge pole of such a roof is made exactly like one of the main ribs of the principals, with similar sockets for the rafters. The slates are fastened to the laths in the ordinary way; and, where a metallic covering is used (which is usually cheaper, as requiring a substruction of far less strength), it is laid in the common form. It will generally be cheapest to put perforated or solid gables to such a roof as this; but, when of great length and span, it will need to be hipped, the modification for which is so simple, as not to need description. The rafters may remain bare inside in these roofs, or may be ceiled; but when the slates are rendered smooth underneath, or the roof is sheeted with wood, and painted inside, it looks very ornamental, and is more suitable to a riding-house than a plastered ceiling. The wood is all exposed, so that it is not liable to the dry rot. For spans above forty feet this roof will always, in this country, be cheaper by far than a framed timber roof, and better too. I have never seen a roof, or heard of one, like this; and, therefore, it is original with me. The roof which most resembles it, of any I have seen, is that of the sheds at the Clarence Docks, Liverpool; but these sheds have been erected long since I made my original drawings of this roof.

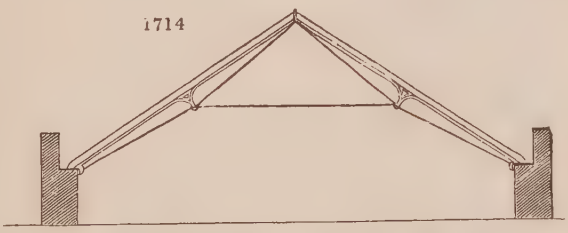
a 1713



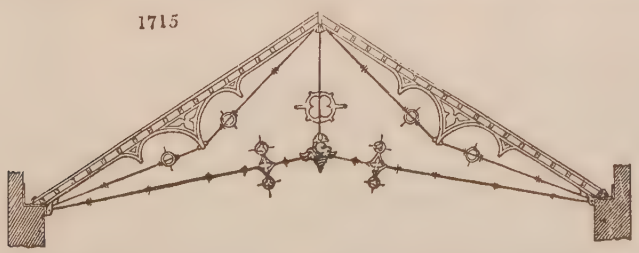
a

1941. *For Roofs of less than Thirty Feet Span* there may be a modification of the main tension rods, as in fig. 1714; and ornaments may be applied, particularly in the Gothic style (where appropriate), as in fig. 1715. These ornaments are produced by cast-iron, cast on the wrought-iron tension bars; but when great strains are expected, they are cast with holes, and leaded on, as casting on injures the fibre of the wrought iron."— We greatly admire the construction of these roofs, but we

1714



1715



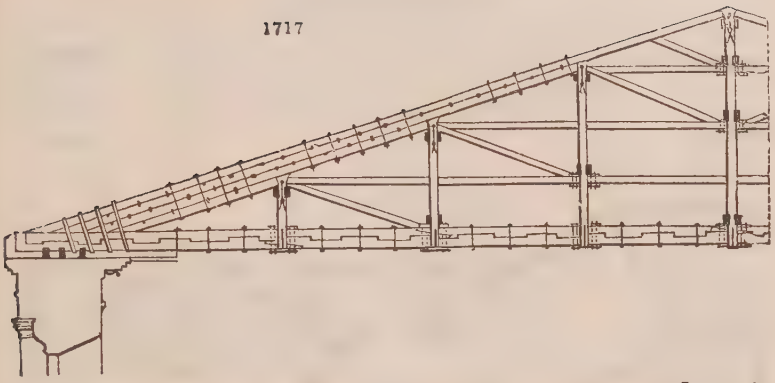
cannot bring ourselves to consider as in good taste, the practice of applying ornaments to the tension bars, either by casting on, or leading on. A tension bar of metal can never be so expressive of its use, as when it is perfectly plain; loading it with ornaments

altogether counteracts the expression of tension; and whenever an ornament either is, or appears to be, at variance with the expression of the use of the part to which it is applied, it becomes a deformity. All the struts, or pressure pieces, of an iron roof may be ornamented without any offence against the principle of fitness; and this Mr. Mallet has done very judiciously, in the main ribs and pendent struts of fig. 1715.

1942. *A Cast-iron Roof for a Riding-house* may be formed on the same principle as one designed by the late Mr. Tredgold, for covering the corn market at Norwich. Fig. 1716 is a section showing the half of one of the cast-iron rafters of this roof, in the form of a Gothic arch, with the spandril filled in with tracery. The span is fifty-four feet; the columns, *a*, from which the cast-iron arches spring, are of stone; the walls of brick, and the roof covered with slates, nailed to boards, supported by wooden purlins and rafters. The purlins, shown at *b*, are eight inches and a quarter by five inches and a quarter, and the rafters are four inches and a half by two inches and a half. This section was kindly furnished to us by our much esteemed friend Mr. Thorold, who, having been for many years on intimate terms with Mr. Tredgold, possesses his working-plans and calculations for this and for various other great works. It is evident that a roof of this description, on a riding-house, would have a very grand and rich effect: there might be a row of Gothic windows in each of the side walls, and one large window in each gable reaching from the ground to the roof; the lower parts of which windows might serve as doors. Above the doors, in the inside, there might be galleries for spectators.

1943. *The Framing of a Timber Roof for a Riding-house of great Width*, and where, as in Russia and America, timber is abundant, might be constructed on the principle of that of the *Grande Salle d'Exercice* at Moscow, one half of a single truss of which is shown in fig. 1717. This magnificent exercising-house is 150 feet (French) broad, and 502 feet (French) long; the walls are 40 feet high, and 8 feet thick above the ground; and their foundations, which are 12 feet under ground, are 14 feet thick. The building was constructed in 1817, including the making and burning of the bricks for the walls, and the cutting down of the timber for the scaffolding. It was begun and finished in the short space of five months, in order to enable the Emperor Alexander to exercise his troops in it, during the winter of 1817–18 which the

1717



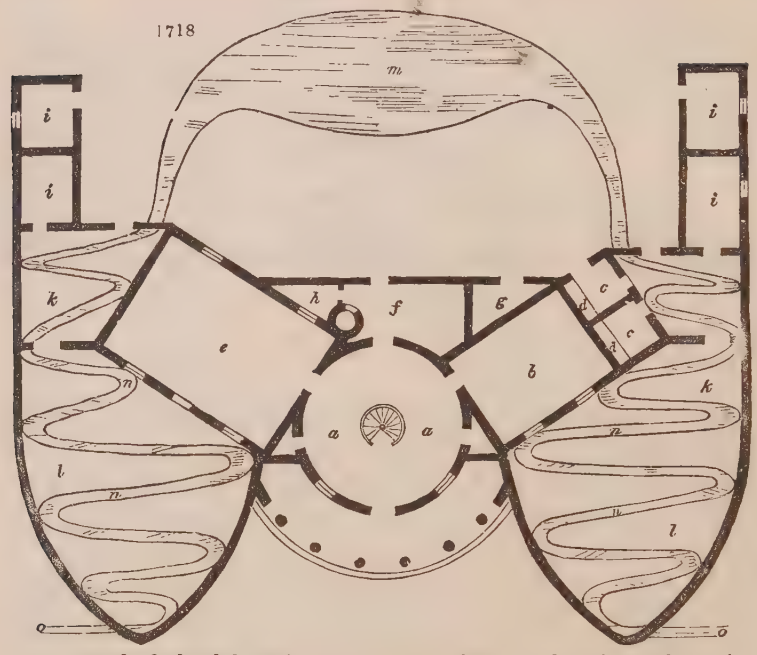
imperial family passed in Moscow. The roof is covered with sheet iron. It was the invention of General Bétancourt, who states that its principal merit, as a piece of construction, consists in the manner in which the king and queen posts and struts are joined to the principal rafter by iron shoes, by which the effect of compression on timber is avoided. The various details, together with an interesting account of the manner in which the strength of the rafters was proved before they were put up, will be found at length in Bétancourt's *Description de la Salle de Moscou*, &c. It appears, by that work, that this is the largest building that has ever been covered by a single roof; the next largest is an exercising-house, built by the Emperor Paul at St. Petersburgh, which is 119 feet (French) broad, and 552 feet long. Beautiful as is the construction of the roof of the exercising-house at Moscow, its exterior architectural effect, as shown in Bétancourt's perspective view, is completely spoiled by the walls being finished with half columns, with semicircular-headed windows, and far-projecting cornices over them in the intercolumniations. The utter destruction of simplicity by this arrangement is to us quite intolerable. It is lamentable to see an Architect throwing away so fine an opportunity of establishing his fame. There is nothing original in the construction of the roof, as any one may see in the works of Borgnis, Kraft, Rondelet, and other authors; but there is the merit of greater dimensions than were ever before attempted. In the works of Rondelet and Kraft, and from them copied into the *Carpentry* of Mr. Tredgold, is a design for a roof of still larger dimensions than that of Bétancourt, which is there said to have been executed at Moscow; but Bétancourt informs us that that roof never had an existence except on paper.

1944. *Riding-houses in the Country* are often used as *tennis courts* for playing at bowls and other games; and even for archery in wet weather during winter. When a riding-house is to be used as a tennis court, the floor must be laid with flagstones for the latter purpose, and the paving be covered with straw, sawdust, or sand, for the former. If, instead of flagstones, chumps of wood are substituted for paving, the floor will serve both purposes without any covering. Some hotels of extraordinary dimensions have lately been erected at New York and Boston (Holt's House and Tremont House, for example), and, as these cities increase in wealth and luxury, we have no doubt they will attempt riding-houses of this kind; which, in a country where the ground is covered with snow for so many months in every year, and where the summers are so very hot, must be of great use as places for recreation, either in severe weather or during hot sunshine.

Sect. III. *Dog-kennels.*

1945. *The requisite Accommodations for Kennels for Sporting Dogs* have been given by Selim, § 1721; and we shall, therefore, here merely describe a dog-kennel which was erected from a Design of ours, at Garth, in 1811. The situation is on an eminence, considerably higher than that on which the dwelling-house stands; and forming with it and the stables, described § 1937, three architectural groups on the side of a high, irregular, richly wooded hill. The view is most extensive, and in order that the dogs may see it from their yards, these should be surrounded by light open railings (and not by walls as in figs. 1719 and 1720), it being found, as Somerville and others have observed, that dogs are always quietest when their kennels command an extensive prospect; on the same principle, perhaps, that the most high-spirited horses become perfectly tame when exercised on the sea beach. Fig. 1718 is the ground plan, in which *a* is the vestibule and show-room, with a stair in the centre, behind which is a stove; the stair leading to

1718



a store-room for food and for various articles required for hounds, pointers, &c.; *b* is a room for pointers; *c*, breeding-rooms; *d*, couches in these rooms for the dogs to sleep on; *e*, room for hounds; *f*, boiling-house, the flue from the boiler serving to heat the show-room in ordinary weather, there being a separate stove for use in severe weather; *g*, place for carrion; *h*, place for fuel; *i i*, hospitals; *k k*, small yards sloping one inch in two feet; *l l*, large yards with the same slope; *m*, reservoir of water supplied by a spring; *n*, channels for irrigating the yards and washing the rooms. These channels are only one inch deeper in the centre than the general surface of the yard, and their sides are sloping, so that, when the water is turned on by raising the sluices of the reservoir, it spreads over the whole surface of the yards, and, with very little assistance from a broom, soon renders them perfectly clean; *o o*, drains which lead to a cesspool for the deposition of the solid part of the manure carried off by the water; the liquid part overflowing in gutters, so formed as to irrigate a sloping water-meadow. We have given two elevations of this Design, both different from that which was actually executed; and both having walls surrounding the yards, instead of open iron railings,

1719

which, as before stated, are preferable. Fig. 1719 is a perspective elevation in the Tudor Gothic style; and fig. 1720 is an elevation in the Italian manner: both are designed by Mr. Lamb. The peculiar shape of the open courts in the plan was indicated by the form of the ground, and by the necessity of having such a slope as would carry off the water rapidly. If, in designing country buildings, Architects were to take hints for the general forms and dispositions of the masses, from the ground on which they are

1720

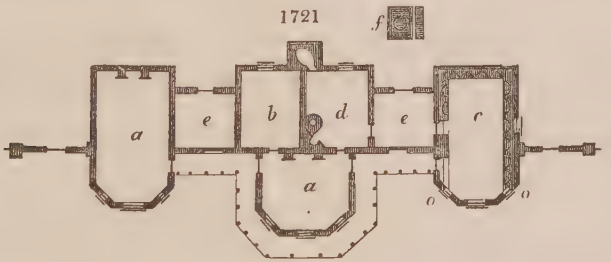
to be placed, and from the surrounding scenery, much more than they appear to do, we should not have such frequent repetitions of the same form, and so many common-place structures, such as may be set down any where. This principle ought to be attended to even in the humblest buildings; for by it, even independently of architectural details, the interest created by them may be much enhanced. By this means a building may be made to appear to have arisen out of the situation in which it is placed, instead of appearing to have been brought there from some town or village.

Sect. IV. *Ornamental Dairies and Poultry-houses.*

1946. *The Principles for constructing Dairies and Poultry-houses* have already been laid down at sufficient length (see § 729, 1728, for dairies; and 770, 1325, and 1356, for poultry-houses), and we shall here content ourselves with giving an example of each, rendered ornamental, and suitable for an appendage to a villa.

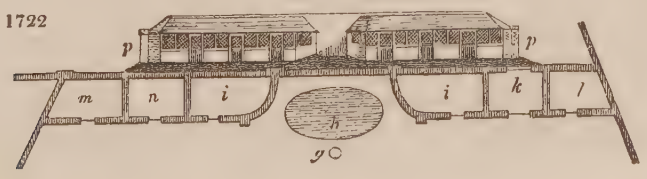
1947. *The Dairy, Cottage, and Poultry-house*, at Syndal House, Kent, is shown in the general view, fig. 1723, and the ground plan in figs. 1721 and 1722. Fig. 1721

1721



shows the ground plan of the dairy, and cottage for the dairyman, with the position of the poultry-yard. The dairy-cottage consists of two sitting-rooms, *a a*; a bed-room, *b*; dairy, *c*; scalding-room, *d*; and two covered sheds, *e e*: the situation of a pump, well, and cistern in the poultry-yard is shown at *f*. The cow-lodge is at a short distance from the dairy, but it is surrounded by plantations, and completely hidden from the view. Fig. 1722 shows the elevation and ground plan of the poultry-houses; in this, *g* is a pigeon-house fixed on a post; *h* is a pond; *i i* are two houses for hens; *k* is a house for ducks; *l*, one for geese; *m*, one for turkeys; and *n*, one for fatting-coops. The lower

1722



part of the front wall of the poultry-houses is of brickwork, and the upper part of open latticework, as shown in the elevation, *p p*; the latticework is painted green. For the better

1723

ventilation of the place, and the health of the fowls, this latticework is left open during summer; but each division is furnished with wooden shutters, attached to the plates inside by hinges, which, during the winter nights, and especially in frosty weather, are kept closed. The centre of the dairy-cottage is for the dairyman and his wife to reside in; and the large sitting-room is intended as a room in which the family at the villa might occasionally eat strawberries and cream, &c. The dairy, which forms the corresponding wing to that containing this room, is of a greater height inside, as the floor, which is paved with square 14-inch tiles, is sunk about 2 feet below the level of the ground. The upper shelf for the milk-pans is made of black slate, supported by brick arches, each arch forming a recess below for a pan of milk, fig. 1724. In the space between the doors is a small stone trough, supplied with water from a cistern at the well in the poultry-yard, by a pipe laid under ground. In the centre stands a large marble or stone table. The two small windows marked *o o*, in fig. 1721, are blanks, forming niches in the inside, in which are placed terra-cotta figures of a bull and a cow. In the centre of the angles formed by the arches supporting the slate shelves are fastened small rams' heads. These internal decorations give the dairy an air of finish and taste. Instead of the marble table, there might be a marble or stone basin, with a jet or fountain in the centre, and the floor might be laid with Wright's tessellated paving-tiles, to be described more at length hereafter. Where slates are abundant, they might be used, both for the floor and the central table, and painted in imitation either of marble or oilcloth. Oil painting on slate is found very durable, and will bear daily washing, and even scouring, without injury; paint also renders the slates warmer to the feet. The covered shed, fig. 1721, *e*, next to the dairy, is fitted up with racks, in which the milk-pans and other dairy utensils are set to drain, and the corresponding shed on the other side has bins, &c., to keep the corn and provisions for the poultry, and the dairyman's beer, &c. As coolness in summer and warmth in winter are essential to a dairy, the wings of the building are neatly thatched with a thick coat of reeds; the centre is slated.

1724

1948. *The Dairy at Alnwick Castle* is surrounded by a deep veranda, the supports of which are festooned with climbers: this completely shades the wall, and its doors and windows, from the sun; except at mid-winter, and before and after that period till the sun at midday is 25° above the horizon. The roofs are thickly thatched. These arrangements are found to keep the interior of the dairy perfectly cool in summer; and, with the occasional introduction of vessels of hot water from the dairy scullery, and the heat of the new milk itself, sufficiently warm in winter. The walls are lined with glazed white tiles, the floor is paved with tessellated bricks, the shelves are of white marble, and the vessels in which the milk is kept are of white Wedgwood ware. The ceiling is plastered, and there is a handsome cornice. The middle of the floor is occupied by a very large and

thick white marble table, raised about two feet above the floor; on this table are placed the dishes of new milk. These dishes are of an oblong shape, having at one extremity the edge turned over in the shape of a lip, to facilitate the pouring out of the milk. Large vases and jars of coloured china are placed as ornaments on the marble shelving round the walls. (*Quart. Journ. Ag.*, vol. vi. p. 158.)

Sect. V. *Aviaries and Menageries.*

1949. *Aviaries* are of two kinds; those for birds of song, and those for birds of show or curiosity. The former are not very common in Britain; but, where they do exist, they are usually joined to conservatories. Their general form and style should harmonise with those of the house; no particular shape or dimensions are requisite, but it is always desirable to have the whole or a part of the roof of glass; to have glass windows on, at least, two sides; and to have a complete lining of wire network within every window and door, in order to prevent the escape of the birds, and the ingress of vermin when the sashes are open for ventilation. There should also be a porch with double doors, for the same purpose. Sometimes aviaries are formed on a large scale, and include trees, shrubs, turf, and water; the whole being covered with wire netting. In this case, the extent ought to be considerable, and the birds few, otherwise the trees and shrubs will soon be injured, and the whole place rendered unsightly. Where the object is simply to hear the song of the birds, it is found a more effective and cleanly plan to distribute a few cages up and down a conservatory; or along a veranda. The birds are found to sing better when they are within hearing, but not within sight, of each other; and the cages prevent that appearance of dirt on the trees, plants, and paths, which is generally offensive in a crowded aviary. To prevent the possibility of any dirt, seeds, &c., being thrown down from birds in cages, the latter may be constructed with a small cellar or box from four to eight inches deep in the bottom; in which alone food and water may be placed, the bird descending through an opening in the upper floor to eat his food, and ascending again by a small stair or ladder. This construction is found effectually to prevent birds from scattering the husks of their seeds; and we have seen the same principle applied on a large scale in chamber and conservatory aviaries, where the birds are kept in niches, with fronts of open wirework, by forming concealed recesses in the sides of the niches, where alone the birds can take their food.

1950. *Aviaries for Birds of Show and Curiosity* are not uncommon appendages to English villas. The tender exotic birds are kept in structures with windows to the south, and heated during winter by flues, or steam or hot-water pipes, as in the extensive aviary at Knowlesly, near Liverpool; and in those of the Zoological Gardens, London. Birds which will endure the open air of Britain, are confined in rustic structures resembling large cages or hen-coops covered with netting, and containing small houses for the birds to retire into during the night, or heavy rains. These cages or coops often contain trees and shrubs, which are renewed as they become injured or decayed. The most complete aviaries of this kind in England are at Woburn Abbey. Some of them, as at Knowlesly, and in the Zoological Gardens, include enclosed basins for aquatic fowls. Those who desire more information on this head will find it in the published descriptions of the London Zoological Gardens. A description of the Surrey Zoological Gardens, with the ground plan and elevation of a circular building with a glass roof, combining at once a conservatory, aviary, menagerie, and a running stream stocked with exotic fish, will be found in the *Gard. Mag.*, vol. viii. p. 693.

1951. *Menageries* are sometimes found in villa residences, and, when combined with aviaries for hardy terrestrial birds, and formed on a large scale, with all the birds and animals in one enclosure, are much more interesting than aviaries or menageries where the birds and animals are confined in separate structures. The finest we know in England is at Cobham Hall, in Kent; where the kangaroo, the opossum, the zebra, the quagga, several kinds of goats, sheep, and deer, the ostrich, the emu, the cassowary, and many other birds and beasts, live in harmony together on a lawn of several acres, finely ornamented by foreign trees and shrubs, and surrounded by a wire fence fifteen feet high. There are suitable ornamental structures for the animals to retire into, and constant attendants to see that they are properly provided with food, and that they do not injure one another. In a mixed aviary and menagerie of this kind at Chiswick, the Duke of Devonshire had lately a great many species of aquatic fowls, a bear, several kinds of monkeys, and an elephant; the last being kept in an appropriate house, heated during winter.

Sect. VI. *Architectural Conservatories.*

1952. *Conservatories* are most desirable additions to villas, as indicating the residence of ease and elegance; as affording a useful source of exercise and recreation during

severe weather, and in winter; and as contributing an important architectural feature to the general group of the dwelling-house and offices. There can be no reason why a small house should not have a large conservatory; because, the first cost once incurred, the expense of keeping up a large one is not much greater than that of a small one; and more especially, because a large conservatory, unlike a large dining-room or drawing-room, does not imply that the occupant sees much company, or is expected to indulge in an expensive style of living. We shall consider the conservatory in regard to aspect, dimension, modes of growing the plants, construction, mode of heating, and architectural style. Our observations shall be brief; because the subject belongs more to Gardening than Architecture; and because it will be found treated of more at length in our intended *Encyclopædia of Landscape-Gardening and Garden Architecture.*

1953. *Aspect and Position.* The best aspect for a structure in which plants of any kind are to be grown is, in general, the south, or any point between S.S.E. and S.S.W. The chief advantage of a south aspect for large plants, such as those grown in conservatories, is the heat gained from the sun's rays in winter and spring; but where this heat can be supplied by art, and where the economy of fuel is no great object, it matters little what may be the aspect of the conservatory, provided it be not shaded by some other building, or so placed as not to admit of ventilation. The most desirable position, when the conservatory has glass on all sides, is that in which the length of the building is due south and north; because, as the principal walks in it will be in that direction, the sun will shine on the sides of the trees next the walks, every day whenever it shines, throughout the year. This is an important object to keep in view in laying out the walks in all conservatories; for it will be observed that, both in them and in shrubberies, those sides of the trees and shrubs which face the north are never so finely clothed with foliage and blossoms as those which face the south, east, or west. For this reason, when the position of a conservatory is east and west, the walk in the middle ought to be much broader than when the position is north and south, in order to admit more free access to the sun's rays.

1954. *Dimensions.* The laws of vegetation render it utterly impossible that a small conservatory can ever look well. A conservatory is for the growth of trees and shrubs, not, like a green-house, for mere pelargoniums and other small plants in pots; and trees and shrubs, to look well, must have room, and especially breadth, to expand themselves. As every conservatory, however narrow, must be at least of the height of the apartments with which it is connected, the width, if not considerably greater than the height, will always occasion the plants within to have an etiolated appearance. Supposing the height of a conservatory to be twelve feet, the width should never be less than eighteen feet; it being understood, as will be afterwards shown to be essential, that the whole of the roof is to be of glass.

1955. *Mode of growing the Plants.* There are two modes of growing plants in conservatories; the one is by having them in large tubs, boxes, or pots, as in the case of orangeries, which are properly called orange conservatories; and the other, by having them planted in the free soil. The first mode has several advantages belonging to it, the principal of which is, that the trees may be removed from the conservatory, when in an unhealthy state, and invigorated in a structure better adapted for their growth. This also is the only mode by which trees can be kept in conservatories with opaque roofs. In conservatories where trees are planted in beds of free soil, they almost invariably grow with much greater vigour than when their roots are confined in tubs or boxes, however large, and the allusion to a shrubbery in the open air is much greater; the expense is also very considerably less. For conservatories of this description, it is essential that the roof be wholly of glass. Structures, where plants are kept in pots set on stages, are called green-houses; and, by some, these are preferred to conservatories, as admitting of the display of a greater number of kinds of plants: but as the plants, in this case, are always small, they can never thrive well in houses displaying architectural elevations, from the distance at which the plants must necessarily be from the glass roof; and from the large proportion of opaque material which the construction requires in the front of the edifice. Small plants in pots, in short, can only be well grown in those shed-like glass-roofed structures which belong to kitchen-gardens and nurseries; and these, in our opinion, are, from the associations connected with them, utterly unfit for combining with architectural forms, so as to compose a whole, with the dwelling-house of a villa. Where the trees in a conservatory are grown in tubs or boxes, these should always be covered with cases exhibiting handsome architectural forms; such as vases, sarcophagi, &c.; unless a mode be adopted which is practised in some conservatories in Italy, as at Monza; and in England, as at Nuneham, near Oxford, of having trenches or pits sunk in the floor of the conservatory, in which the tubs or boxes are placed, with a false cover of boards over them; this cover being again concealed by turf or moss. Conservatories of orange trees (and these and camellias are among the best conservatory plants) look

remarkably well in this manner. Indeed, in our opinion, where conservatory plants are not grown in the free soil, this mode is preferable to any other; because the allusion to natural scenery is more complete.

1956. *Construction.* The walls of the conservatory should always be formed of the same material as those of the house to which it belongs; because this is favourable to the principle of unity of effect. Cast iron, however, is in many cases extensively employed as standards between the upright sashes; and, in this case, the harmony may be preserved by the introduction of stone or brick piers at the angles, or on each side of a central door, or projection, or recess. In the conservatory of Mr. Mallet's Design for a villa, fig. 1660, there is a great deal of ironwork exposed to view; but, by the introduction of stone piers, a stone architrave, and a considerable mass of walling behind the central semi-dome, the harmony is perfectly preserved. There is one point in the construction of conservatories which ought never to be neglected; and that is, as we have before observed, to form the roof wholly of glass. Without perpendicular light no plant whatever, and more especially no tree or shrub, will ever grow and look well. To be convinced of this, it is only necessary to observe the plants grown in conservatories in which the roof is partially or wholly opaque; they will be found, even in the most favourable cases, only to look well on one side. Provided the roof of a conservatory be wholly of glass, the walks broad, so as to allow of a free circulation of air round the trees, and provided the cost of fuel for keeping it at a temperature of 50° during the winter months be no object, it signifies much less than is generally imagined what may be either the aspect or the position of the conservatory. The floor of the conservatory, where the plants are to stand in tubs and boxes, may be paved; but, where they are to be planted in the ground, space and sufficient drainage will be required for a bed of soil of five or six feet in depth. As there must be walks between the beds, piers should be carried up from the bottom, to support the pavement, or iron grating, which may form those walks.

1957. *The Mode of heating Conservatories* is commonly by smoke flues, or tubes of steam or hot water carried under the paths. Other modes have been practised; such as flues or tubes above the surface, cisterns, or cylinders of steam or hot water, and the introduction of hot air from cockle stoves; but no plan, in our opinion, is so suitable as that of introducing whatever medium may be adopted for conveying the heat, under the pathways; having such an arrangement of openings in the top or sides of the paths as will insure a circulation of air round the heating body. Without this circulation to carry off the heat from the tubes or flues, heat will be given out so slowly to the house, that in severe weather it will hardly be possible to keep up the proper temperature. The circulation may be produced by enclosing the tubes, for a considerable length, by the walling which supports the pavement of the path; and by having an opening at the bottom of the funnel formed by this walling at one end, and another and larger opening at the other end, in its top, or in the pavement over it, for the escape of the heated air. In a conservatory of considerable length and breadth, in which the tubes are conducted round the floor, and also along the middle of the house, there may be several systems of circulation of this kind; say, for example, one for every thirty feet in length of the steam or hot-water tubes. These systems may be so arranged as that the openings for the escape of heated air, and those for the drawing in of the lower stratum of the air of the house, in order that it may be re-heated, may be regularly distributed over the floor of the conservatory. This has been admirably effected by Mr. Kewley, in the magnificent conservatory heated by him at Clarence Lodge. From not attending to this mode of carrying off the heat from flues and tubes sunk under the floors of conservatories, some have been imperfectly heated, and others heated at a much greater expense of tubes than would have been at all necessary by a proper plan. This subject is better understood by Mr. Kewley than by most of the engineers who heat by hot water or steam in the neighbourhood of London; but a little attention to the plan of Mr. Perkins for accelerating the production of steam by metallic linings to boilers, will at once show the importance of it, and teach the manner of carrying it into execution. (See *Gard. Mag.*, vol. viii. p. 294.) In modern conservatories it is not uncommon to see the tubes or flues for heating, forming conspicuous objects along the walks; than which we can hardly conceive any thing more unsuitable to the idea of an ornamental structure. It would be better far to have no conservatory at all, than to see it thus reduced to the level of a nurseryman's show-house, or the forcing-house of a kitchen-garden. A conservatory so constructed as not completely to conceal the mode by which it is heated, is one of the most imperfect of villa appendages. Before the mode of heating by hot water or steam was invented, there might have been, comparatively, some excuse for not concealing flues; but now that we have Perkins's mode of heating by hot water, by which the largest house may be heated by tubes not above an inch in diameter, deformities of the kind mentioned are inexcusable. Pumps, cisterns,

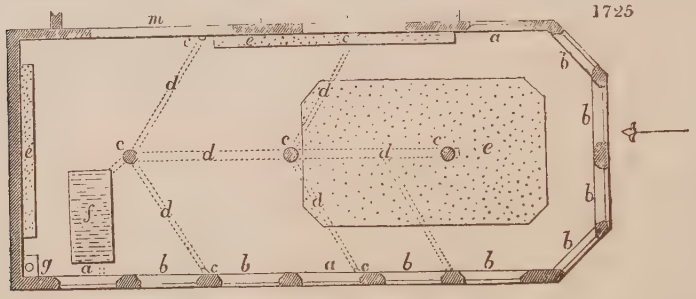
and contrivances for watering, ought, in like manner, never to be displayed in a conservatory; nor, indeed, any thing which is likely to create an allusion to, or a comparison with, a common-place garden green-house.

1958. *The Architectural Style of Conservatories* attached to dwellings, must obviously be governed by that of the house to which they belong; and there are few appendages which afford better opportunities for displaying the grander features of every style of building; such as columns, piers, arches, &c. The elevation of a conservatory in the Grecian style may be composed of square columns set on a plinth, and surmounted by an architrave, frieze, and cornice; a Roman or Italian elevation may consist of an arcade, similarly placed, with a cornice and blocking course, or parapet; and a Gothic elevation may be formed of a series of pointed windows, with or without buttresses, or small angular towers terminating in finials, between.

1959. *One of the simplest and most economical Descriptions of Conservatories in the Gothic Style* is described in vol. vi. of the *Gardener's Magazine*. It was built by a common village bricklayer and carpenter, in the neighbourhood of Nottingham; and, though forty-three feet long, and eighteen feet wide, the cost was little more than £250.

Fig. 1725 is the ground plan, of which *a a a* are three doors, each dividing in the middle. These doors are hung upon Collinge's patent hinges; and are lifted on and off with the greatest ease. The letters *b b* are Gothic lights or windows, resembling the

1725



doors. The letters *c c* are cast-iron pipes, conducting the rain water from the roof gutters into the drains *d d*, which carry it into the tank *f*. The letters *e e* are beds containing soil of the quality best suited to their respective plants. The tank *f* is twelve feet square by ten feet deep, arched over, and covered with a movable flagstone at the mouth, supplying the pump *g*, through the bottom of the trough of which, the waste water is again returned into the tank; *m* is a glass door opening into a library; and *n* a similar door opening into a drawingroom.

1726

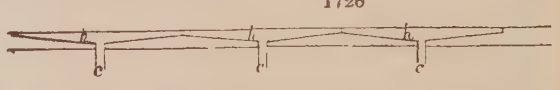


Fig. 1726 is a section of the main beam, forty-four feet long, extending through the centre of the building, upon which the inner ribs and lights rest. The gutters lined with lead, *h*, are cut out of the solid beam, and fall each way to the three hollow cast-iron pillars, *c c c*, standing over the centre drain.

Fig. 1727 is a cross section of the roof, in which *l l l l* are the rafters on which the lights rest, exactly after the same manner as those of the common cucumber frame; with the addition of a slip of wood, five inches wide, extending from the ridge to the gutters along the rafters, to cover the outer woodwork of the lights, after they are returned to their places in September. Without this the rain water would find admission down the openings of the sides of the lights. These slips of wood are essential to the dryness of the house; and if the two or three screws with which they are fixed are well greased, they may be readily taken off from such lights as are removed during the summer. The three lead gutters, *h h h*, should be wide enough in the centre to admit of a person walking along them; *c* is one of the cast-iron pipes, forming a pillar nine feet high, supporting the longitudinal beam, and having five small wooden rods round it, to train climbing plants upon. The ventilating shutter, *l x*, works upon two pivots, and is raised by a wooden rod, which also props it open.

Fig. 1728 is one of the upright lights, six feet eight inches to the spring of the arch, and rising eight inches in the centre, fitting into a corresponding frame, and secured merely by three bolts, *k k k*; *j j* are two windows, fourteen inches deep, each opening upon a horizontal pivot at its centre; the panes of glass are four inches and a half by four inches.

1728

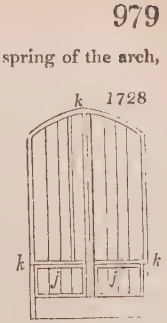
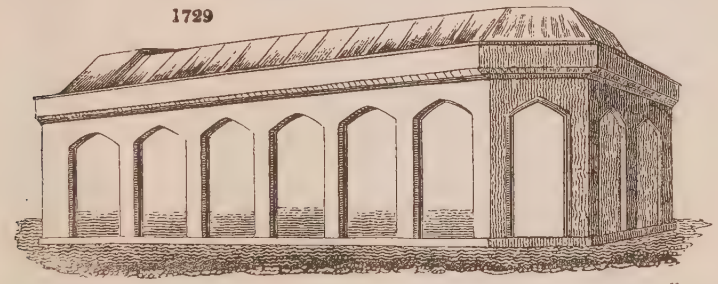


Fig. 1729 is a slight sketch of the elevation, with the doors and lights removed for the summer. The glazing of the roof is curvilinear, each pane being only five inches and a half by four inches; the laps are rather more than one eighth of an inch, with putty between, except a small opening in the centre. Where the best crown glass is used, putty is unnecessary, where merely the usual conservatory temperature is wanted. Not only is the original cost, and the expense of repairs, considerably reduced by using frames of small dimensions, but the risk of breakage from frost is completely avoided when the laps do not exceed one fourth of an inch. Though this house is forty-three feet by eighteen feet, the cost of the glazing did not amount to £50. Where the substratum of the soil does not afford a ready escape for the water from the beds, drains

1729

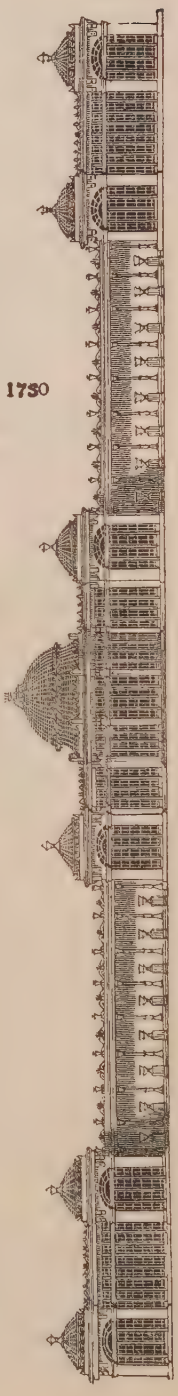


should be made on the outside, and far below the foundation of the house all round; small openings being left in the foundation walls, to allow the water to pass off freely from the bottom of the beds. It is often more advisable to have the plants in pots plunged in the soil, than to plant them in the bed itself; as many species, if turned out of their pots into the free soil, are apt to make a profusion of wood, and to bear but little blossom. (*Gard. Mag.*, vol. vi. p. 664.)

1960. *As Examples of Architectural Conservatories detached from Villa Dwellings*, we may refer to those of Syon House and Alton Towers. The former, designed by Charles Fowler, Esq., is in the Italian style; the general plan is that of a crescent with a parallelogram centre surmounted by a dome sixty feet high, with two parallelograms terminating the extremities or wings. The central compartment is a stove conservatory, having glass on all sides, with the supports in the outside walls, of stone; the upright glass of the wings is divided by stone piers on the south side, and the other walls are without openings. The whole of the framework containing the glass is of cast iron. A part of the roof in the centre is glazed with plate glass: the panes being large, and their inclination to the horizon being oblique, it was deemed advisable to employ this description of glass, in order the more effectually to resist hail. The detached conservatory at Alton Towers is seen in fig. 1429, § 1669; and fig. 1730 is its architectural elevation. The style may be considered as Grecian or Roman. The back wall is of opaque masonry, and the front has stone piers and architraves, filled in with cast and wrought iron and copper sashes. The roof and domes are also of iron-work, and copper, glazed. The whole is richly ornamented with vases and sculptures, and the domes are profusely gilt. The general effect is splendid to a degree, hardly, if at all, equalled in Britain; and the plants within, which are partly those commonly grown in green-houses, and partly tropical or stove plants, being thinly planted, and allowed to attain a considerable size, are as prosperous as could be desired. This Design is in part the production of several Architects; but chiefly, we believe, of Robert Abraham, Esq., and Thomas Allason, Esq. There is another detached conservatory at Alton, fig. 1731, designed by Mr. Abraham, the effect of which is remarkably good. There is also a conservatory at Alton Towers connected with the house, in the Gothic style, of large dimensions, but of simple Architecture, having externally the appearance of a plain cathedral, in which the plants are as prosperous as in the common shed-like glass cases of nurserymen. This conservatory, when we saw it in 1831, was richly ornamented with choice sculptures, fountains, piscatories, vases, china jars, cages of singing-birds, and other suitable objects; and, taken altogether, it was then the most splendid thing of

the kind which we had ever seen. All these four splendid conservatories are heated by steam-tubes, conducted under the paths.

1961. *As an Example of detached Conservatories not architectural*, we shall give the glass dome erected in 1827, for Mrs. Beaumont, at Bretton Hall, Yorkshire. This structure, fig. 1732, was one hundred feet in diameter, and sixty feet high. It was constructed entirely of cast and wrought iron; all the perpendicular supports being of the former, and all the sash-bar composing the ribs of the roof of the latter, material. It was ventilated by horizontal shutters in a low upright wall, or rather iron screen; by upright windows, which opened inwardly at the base of the upper dome; and by a skylight which was raised by weights under the terminating gilt coronet. It was heated by steam from a boiler placed in a house at some distance from it, the tubes being conducted under the floors of the paths. The cost for the ironwork alone was between £3000 and £4000. It is worthy of remark, that there were no rafters or principal ribs for strengthening the roof besides the common wrought-iron sash-bar, which is two inches deep, and half an inch thick in the thickest part, and weighs only about one pound to the lineal foot. The upper dome had an independent support from cast-iron pillars. When the ironwork was put up, before it was glazed, the slightest wind put the whole of it in motion from the base to the summit; and so much alarm did this create in the party for whom it was to be put up, or their agents, that the contractors for the work, Messrs. W. and D. Bailey, of Holborn, London, were obliged to covenant to keep it in repair for a certain number of years. As soon as the glass was put in, however, it was found to become perfectly firm and strong, nor did the slightest accident, from any cause, happen to it, from the time it was completed, in 1827, till, on the death of Mrs. Beaumont, in 1832, it was sold by auction, and taken down. It brought only about £560, though it is believed to have cost in all upwards of £14,000. In the north of Europe, the conservatory or orangery is often used as an entrance-hall, and sometimes it forms a passage, connecting the centre of the house with its wings, as in the palace of Lazenki, at Warsaw; or to connect the house with the stables and farm offices, as in the elegant Italian villa of Count Kownatski, near Brody, of which a sketch, partly from memory, is given in fig. 1733. Plans and elevations of a number of other architectural conservatories will be found in the *Gardener's Magazine*, and in the *Encyclopædia of Gardening*.


1730

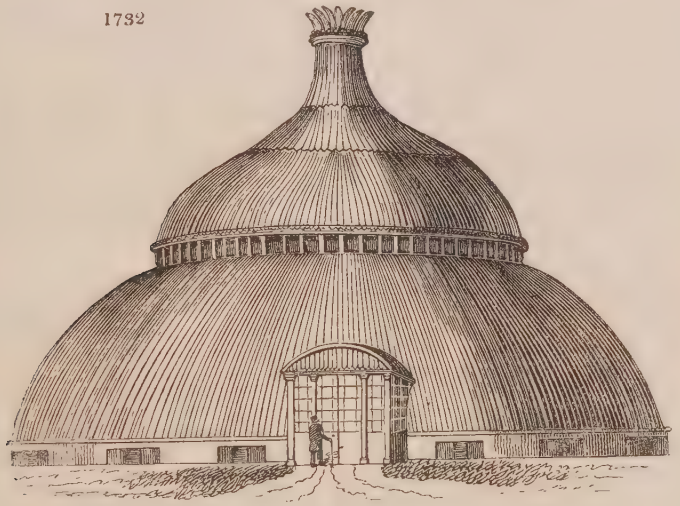
1962. *The Flower-garden* should generally adjoin the conservatory, or at all events be connected with it by a veranda, colonnade, arcade, or covered way of some description. There is not a greater luxury about a villa, either in winter or summer, than a broad veranda facing the south or south-east, and looking out on a flower-garden in the foreground, with pleasure-ground scenery in the middle distance, and a fertile populous valley, with a river beyond. The last part of the landscape is by no means necessary to the comfort afforded by the veranda, though it adds to the effect of the view from it; but the flower-garden in the foreground is essential, because in early spring, the spectator may walk dry and sheltered under the cover, and in summer in the shade, and in both cases be interested by the flowers immediately under his eye. There is a fine veranda of this sort at Ashridge Park, which connects the conservatory with the French flower-garden; and there is one at Bayswater, where the roof is covered with glass, by which means China roses and other early flowering half-hardy shrubs may be trained on the back wall so as to flower early in the season. Shade is produced so as to render the veranda agreeable in summer, by training vines on a trellis under the glass.

1963. *Architectural Flower-gardens* are very suitable garden decorations for adjoining conservatories and verandas. The walks of such gardens are paved with flags, and the edges to these walks are of worked stone. Sometimes also there are baskets, boxes, vases, or other raised architectural vessels constructed entirely of stone,

1731

so as to become fixtures. Some curious forms of this sort have lately been erected in he flower-garden in front of the house at Chatsworth. The oldest and the most

1732

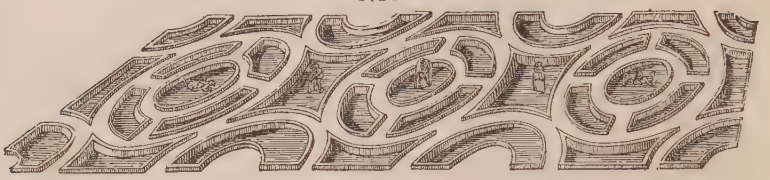


simple design for an architectural flower-garden is to be found in Caus's work on the gardens at Heidelberg, the perspective view of which is given in fig. 1734. It will be

1733

observed, that all the compartments in this garden contain water only, and that five of them display fountains. Further details of this garden will be found in the *Encyclo-*

1734



pædia of Gardening, 3d edit., and in the *Gardener's Magazine*, vol. ix. Much may be done in the way of architectural flower-gardens on the roofs of dwellings in towns and their suburbs, and more especially on those of their offices. In Paris, Florence, and Naples,

1735

there are so many examples, that a book has been written on the subject of taking care of them. (See *Jardinier des Fenêtres*, &c.) Figs. 1735 and 1736 are plans, which may serve either for architectural or common flower-gardens, the walks of which may either be of pavement, gravel, or turf, according to circumstances. The same forms may also afford useful hints for designing mosaic flooring tiles.

1964. *A Sculpture Gallery, a Picture Gallery, a Museum for Antiquities, a Library*, and other luxuries commonly contained within the walls of the dwelling-house of a villa, are sometimes added to it as appendages; and the advantage resulting from this arrangement, in places which are shown to the public, is, that they may be thrown open at all times, without encroaching on the privacy of domestic life. A truly liberal and benevolent man will take incomparably more pleasure in seeing the public enjoy his gardens and grounds, than in having them exclusively reserved for his family and friends. In this respect the German, the Italian, and even the Russian princes are much more liberal than the English nobility.

Sect. VII. *Terrace Parapets, and other mural Ornaments.*

1965. *The Value of Terraces and Parapets* in uniting the house with the surface on which it is placed, and with the grounds which surround it, has been already sufficiently enlarged on § 1649, and we shall here confine ourselves to exhibiting a few Designs by Mr. Varden, from which terrace parapets may be formed in the very cheapest manner, with brick, wood, or even rope. These Designs are evidently the result of much care and study; and they are so distinct, that any builder or carpenter may carry them into execution.

1736

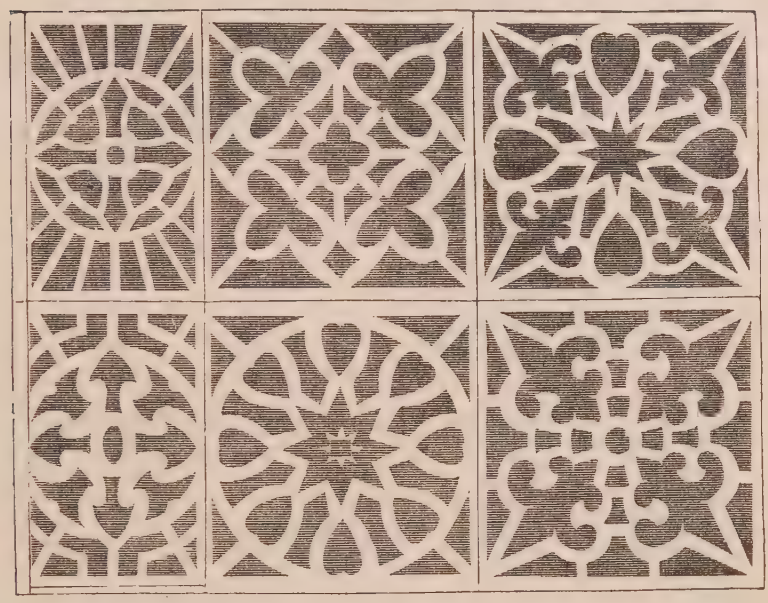
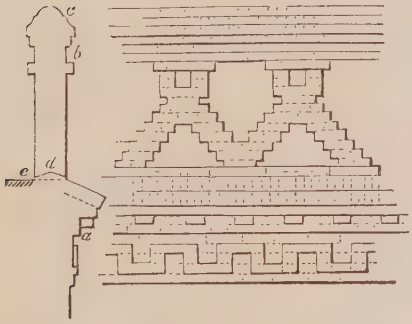
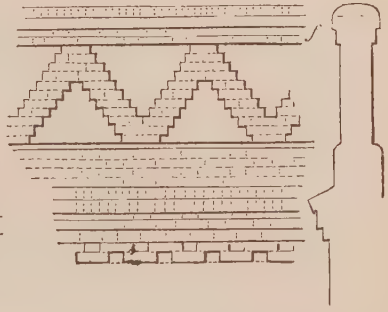


Fig. 1737 is a brick parapet, ornamented with a projecting cornice *a*, formed entirely of brick and supporting a top rail, *b*, which may be also formed in brick set in cement.

1737

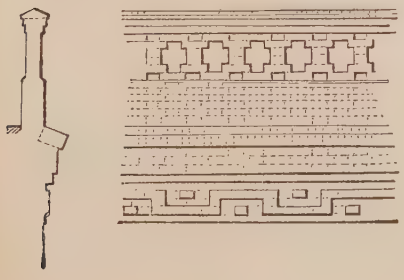


1738



The covering bricks, *c*, may be either rounded, or angular as at *d*: *e* is the surface of the terrace.

1739



1740

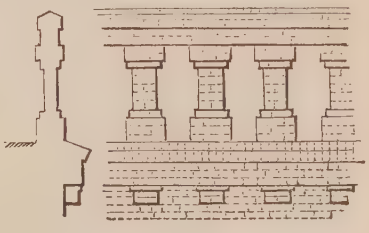


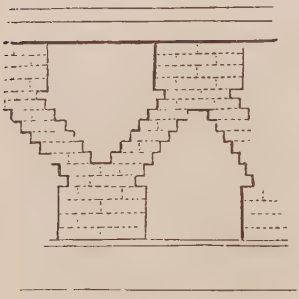
Fig. 1738 is a parapet constructed in the same manner as the former; the railing, *f*, in this case, may either be plain, or covered with cement; or it may be formed of stone or slate.

Fig. 1739 is a similar parapet, in a bold style, with an enriched cornice, and having this great advantage, that it may be executed entirely in brick and common mortar, without the use of cement.

Fig. 1740 is a parapet formed of brick; but with the top railing supported on iron bars, or with the bricks built in cement in blocks, and then laid on without the aid of iron. Lintels of doors and windows are frequently formed in this manner of brick and cement, and then introduced into walls as though they were blocks of stone. Copings to walls are also often executed in a similar manner.

Figs. 1741 and 1742 are brick parapets, of which it has been deemed unnecessary to show the sections.

1741



1742

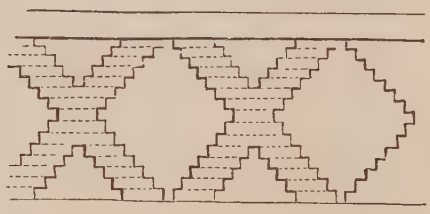
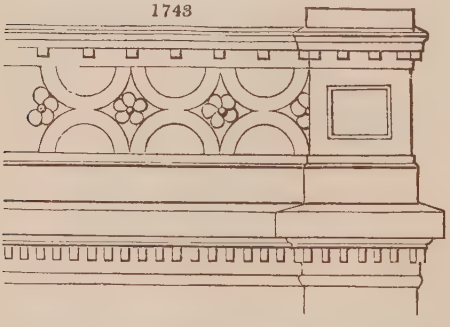


Fig. 1743 is a brick parapet, and corner pier, covered with cement so as to imitate stone. The open work, and also the top rail, may be made with brick and cement, filled into moulds, and then built in as if they were of solid stone.

Figs. 1744 and 1745 show the open work of a parapet, without the cornices or the hand-rails; which may be added at the pleasure of the Architect.

1743

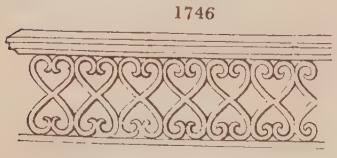


1744

1745

Fig. 1746 is a parapet, the open work or panels of which are formed of baked earth, which may be slipped into grooves in the top rail, and in the plinth. It is evident that a very great variety of parapets may be formed in this manner, and at a very little expense. Balusters of various kinds may also be made of baked earth, and slipped in.

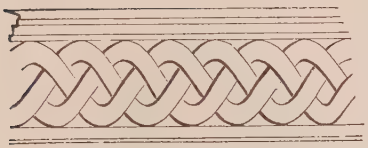
1746



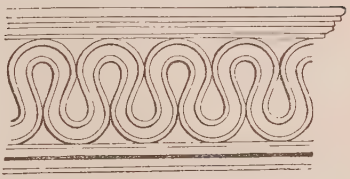
1747

Figs. 1747, 1748, and 1749 are parapets, which may be either formed of real stone, or of baked earth, or of artificial stone.

1748

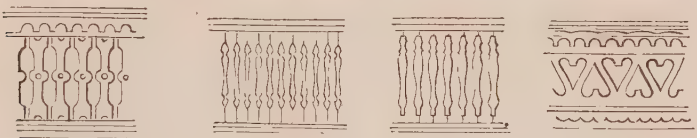


1749



Figs. 1750, 1751, 1752, and 1753 are panels for parapets composed entirely of thick old rope, twisted into patterns, and secured at the laps with copper wire or strong twine. Covered with a thick coating of paint, panels of this sort will last probably for centuries; care being taken always to preserve the coating of paint entire, and free from cracks. The top rail and the plinth may be of artificial stone, also well painted; and there should be standards at regular distances for supporting the rail. These standards may either be of stone or iron, according as they are intended to be covered or concealed.

1750 1751 1752 1753



1754 1755 1756 1757

Figs. 1754, 1755, 1756, and 1757 are parapets in the Swiss style, cut out of flat boarding. The enriched work is sawn out of thin boards, and nailed on blocks, so as to project a little from the face of the rest of the work.

1966. *The Mural Ornaments for Terraces, Parapets, and other Walls about a Villa*, are chiefly vases; but there are also other ornaments and finishings, such as statues globular, oval, square, triangular, or pentagonal forms, hewn in stone, or moulded in clay or other materials and burnt. These are supported on necks or bases, displaying architectural forms; and appearing as finishings to piers, pillars, pilasters, and other component parts of walls and parapets. The most favourable opportunities and legitimate sources for these and such like ornaments are, the piers, lintels, or archways over doors, or other openings filled in with open work. This department in general may be considered as beyond the reach of rules, unless particular cases were given; and, therefore, the Architect must be left to his own application of general principles, and to his sense of beauty, in this description of scenery.

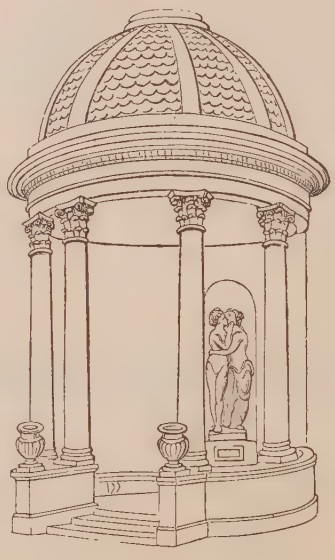
Sect. VIII. *Of ornamental Garden Structures.*

1967. *The architectural Ornaments for Gardens* include prospect towers, seats of various kinds, bridges, artificial cascades, fountains, artificial ruins, rockwork, statues, urns, sundials, grottoes, root-houses and other rustic works, trelliswork, sepulchral structures, &c.

1968. *Prospect Towers* are very desirable edifices in every country seat, and even in the grounds of suburban villas. Their use is to show a stranger the beauties of the surrounding scenery, and to admit of the occupant of the villa inspecting the appearance of his neighbourhood, at different seasons of the year, &c. The architectural style may in general be that of the house; but it may also, in many cases, be different; and, in all small villas, the prospect tower should never indicate a great outlay of expense. In hilly countries, a judiciously contrived artificial ruin will often have a good effect when so applied; it being understood, that the intention is less to deceive, than to create a useful and picturesque object. It is almost unnecessary to observe that prospect towers should have staircases of easy ascent, and should contain a dry airy room at top, furnished with seats and a good telescope. The roof should be flat, in order that it may be used as a terrace; in towers in the Italian style, this terrace will, of course, have a covering open on the sides, in the style of the campaniles. figs. 1694 and 1695.

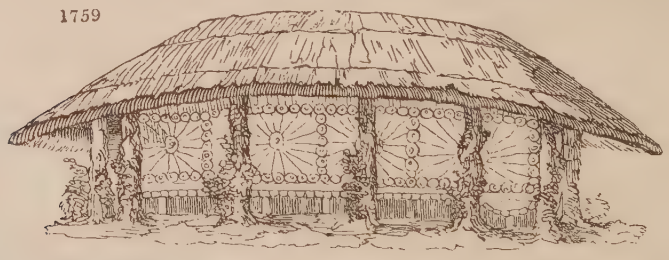
1969. *Seats* are essential objects in all pleasure-grounds. In those of the most extensive and highly enriched description, where a main part of the intention is to display the wealth and taste of the owner, they may appear as Grecian temples (fig. 1758, contributed by M. Field, Esq.,) Gothic porches, Chinese pagodas, or other foreign or antique structures. In the grounds of less ambitious villas, plain unarchitectural buildings may be employed, or wooden structures, simply protecting the seat from the weather, may be resorted to. In England it has always been customary since the introduction of the modern style of gardening, to form what is called rustic covered seats; of which fig. 1759 and fig. 1760, erected on the Duke of Marlborough's grounds at White Knights, Berkshire (see *Hofland's Description, &c.*), may be considered as of a superior description. They are constructed of oak posts formed from young trees with the bark on; and the panels between these posts are first filled in with clay nogging or boards, and afterwards covered in the inside with hazel and other rods with the bark on, and on the outside with slabs of oak, birch, larch, or other durable woods, having the bark naturally varied with mosses and lichens. Birch, from its light paper-coloured bark, broad-leaved elm grown in the shade, and alder, are particularly useful in cases of this kind, from the contrasts which they afford in rustic inlaying. The whole of the Architecture and building of structures of this kind may be considered as a species of child's play, which may fairly be left to the taste of those who indulge in it.

1758



1970. *Bridges* are among the noblest structures which can be erected in pleasure-grounds; and, unlike rustic seats and root-houses, they maintain this character even when constructed of materials of temporary duration, from their obvious and unquestionable utility. A mere plank or tree, when thrown across a stream, assumes a character of grandeur; it commands respect for its power of effecting for man what he could not,

1759

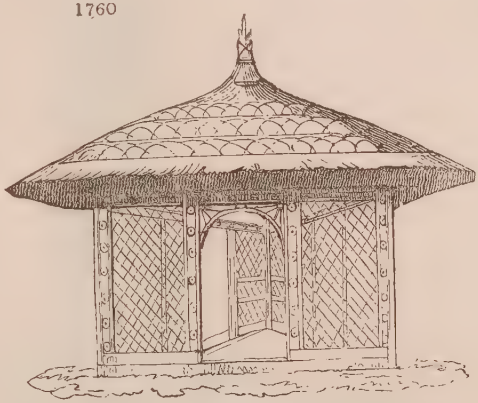


by any possibility, effect for himself. On the other hand, when a trifling stream, or an artificial river, displays a highly architectural bridge of masonry or cast iron, the effect is offensive; because the means seem out of all proportion to the end. In short, a massive highly architectural stone bridge, built across a tame piece of water, not perhaps more than knee-deep, and an elaborate covered seat of rustic cabinet-work, which cannot endure many seasons, offend precisely for the same reason; viz., the unsuitableness of means to ends.

1971. *Artificial Cascades* are of two kinds: those which are constructed in imitation of the natural ledges of rock which cross the beds of rivers in such a manner as to inter-

rupt their streams; and those which are avowedly artificial. The latter are sometimes constructed in the form of semicircular upright walls, the convex side facing the stream, over which the water falls in one sheet; and sometimes, instead of the face of the wall being left upright, a mass of material is placed on the under side of it in a sloping direction, and either covered irregularly with large blocks of stone; or smoothly paved so as to form an undulating surface, with a view of causing the water to pass over it, like the waves of a swelling, but yet, not tempestuous sea. Sometimes artificial cascades are formed by conducting the water along an architectural aqueduct, and terminating this structure in a ruined arch. This has been beautifully done in the gardens of Schweitzingen, by an imitation of the ruins of a Roman aqueduct, fig. 1761.

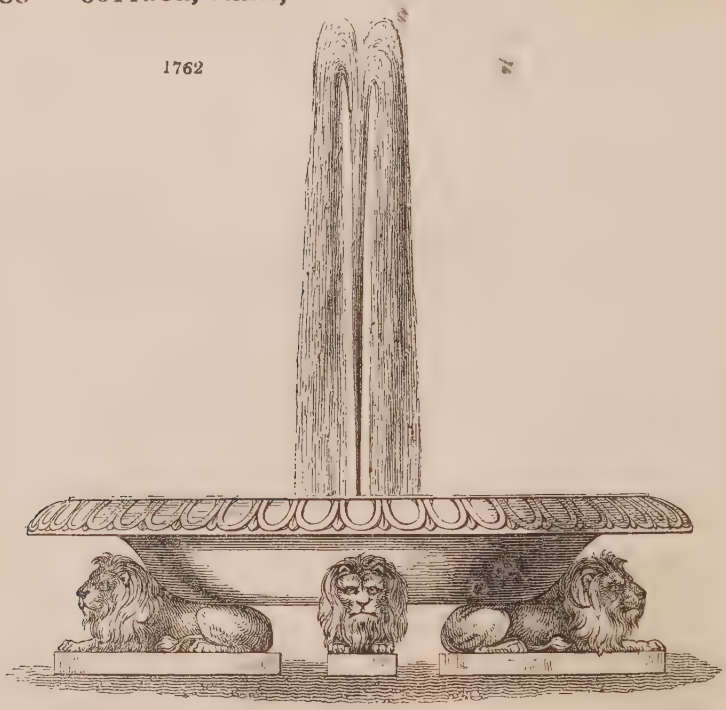
1760



1761

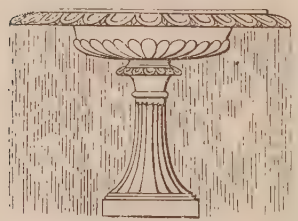
1972. *Fountains.* Water, Switzer observes, is "the very life and soul of a garden," whether it be the ground plot of a suburban cottage, or the embellished lawn of an extensive villa. Two centuries ago, when picturesque beauty and botanical interest were little attended to in the gardens of Europe, fountains and architectural decorations were sought after as the grand sources of interest; and one garden was distinguished from another by the expense which had been incurred in its waterworks, and in its mural and sculptural appendages. For the last century the construction of waterworks has been on the decline; and, in proportion as they engrossed too much attention before, they have, during that period, been comparatively neglected. The manufacture of artificial stone has contributed to the revival of this taste, by the facilities which it affords of forming elegantly shaped basins, and different forms of drooping fountains. By drooping fountains we mean those in which water is conveyed to a height, and then left to trickle down over an ornamental form, as opposed to jet or spouting fountains, in which water is forced to spout up vertically, as in fig. 1762. Another circumstance favourable to the construction of ornamental fountains is, the facility with which iron can now be cast into the most beautiful shapes, at a very moderate expense. With the artificial stone of Austin, or the kiln-burnt artificial stone of Coade and Seeley, which is as durable as the hardest marble; with cast-iron shafts and jets; and with iron or leaden pipes, there is now

1762



no difficulty in constructing the most beautiful garden fountains at a trifling cost, in the grounds of every villa. Figs. 1763 and 1764 are tazza fountains, executed in artificial stone by Mr. Austin. Fig. 1766 is a Gothic fountain, the lower part of which may be executed in stone or marble, and the upper part in cast iron or bronze. This Design is by Mr. Lamb.

1763

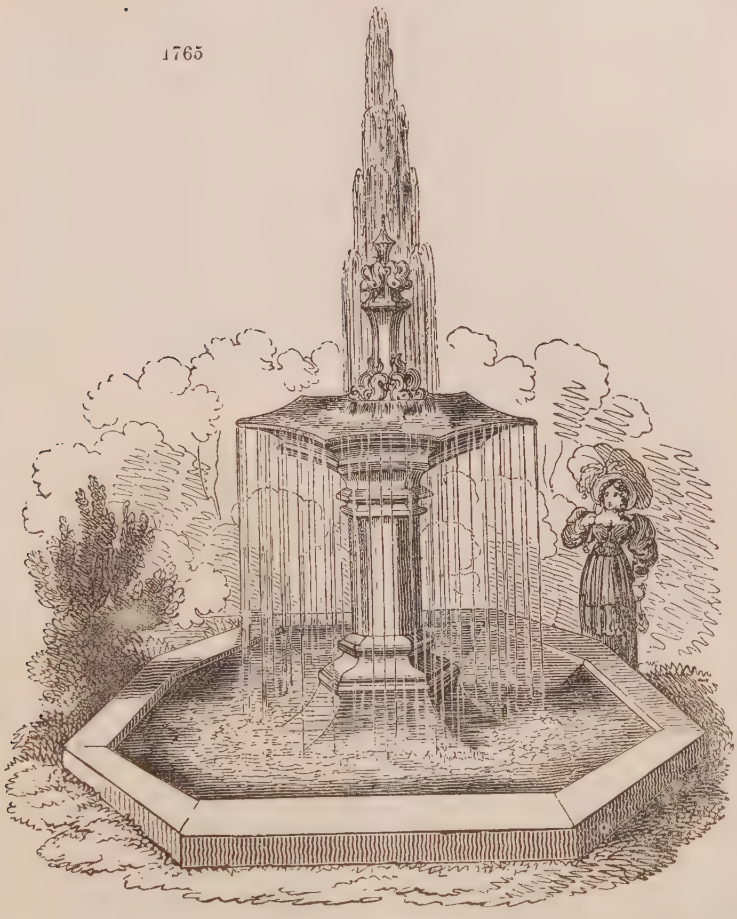


1764

1973. *A fountain may be formed wherever there is either a natural or an artificial supply of Water* some feet higher than the level of the surface on which the fountain is to be placed. Where a drooping fountain is to be adopted, such as fig. 1763, the level of the water in the head need not be higher than the point at which the water issues from the tazza; but if, on the other hand, the water is to rise upwards, as in fig. 1762, the head must be higher than the height to which the jet is expected to rise, by at least several inches, according to the diameter of the jet. Where the jet is small, say an eighth of an inch in diameter, the height of the head above it, provided the water in that head be always kept to the same level, need not be above six inches; but, as it is seldom practicable to keep the head to the same level, it is better to have the bottom of the pond or cistern sufficiently high to effect the desired object; in which case, so long as there is any water in the cistern at all, the jet will rise to the proper height. A great variety of designs for fountains will be found in *Falda's Recueil des Fontaines de Rome, Fontaines de Paris, De Clarac, &c.* Some are also given in the *Choix d'Edifices Publiques*, and in *Coussin's Génie d'Architecture.*

1974. *Where a natural head of water of the proper height cannot be obtained,* recourse may be had to artificial means of raising water to an elevated cistern or reservoir, or of forcing the water upwards by the direct influence of machinery. When the water is raised to a cistern, the latter may either be placed on a natural or artificial eminence, or on the summit of a building. In pleasure-grounds, an artificial mount or piece of conical rockwork, would afford a good situation; and a simple tower, round or square,

1765



is also at once a cheap mode of elevating a cistern, and of adding to grounds an ornament, which, if not very beautiful, can yet never be considered mean or paltry. The water may be raised to the basin or cistern so placed by forcing-pumps worked by men, horses, wind, water, or steam; or by that very ingenious machine, the hydraulic ram (described, *Gard. Mag.*, vol. v. p. 594., as being in use at Bury Hill, Surrey), which has lately been put up in various parts of the country, for this purpose, by Mr. Rowley. However, the mode which we would recommend, as most directly applicable where there is no natural power, is that of having a small steam-engine, say of two-horse power, which might be placed in the lower part of the tower containing the cistern, or in any convenient situation near the well, pond, or other source of supply, and set to work once or twice a week, as occasion might require. A horizontal windmill, so disguised in the tower as not to be an offensive object, would, in all elevated situations, as we have elsewhere observed (§ 1256), be the cheapest and best that could be employed; because it would require little or no attention, and might be left to itself to work or stand still, according to the wind.

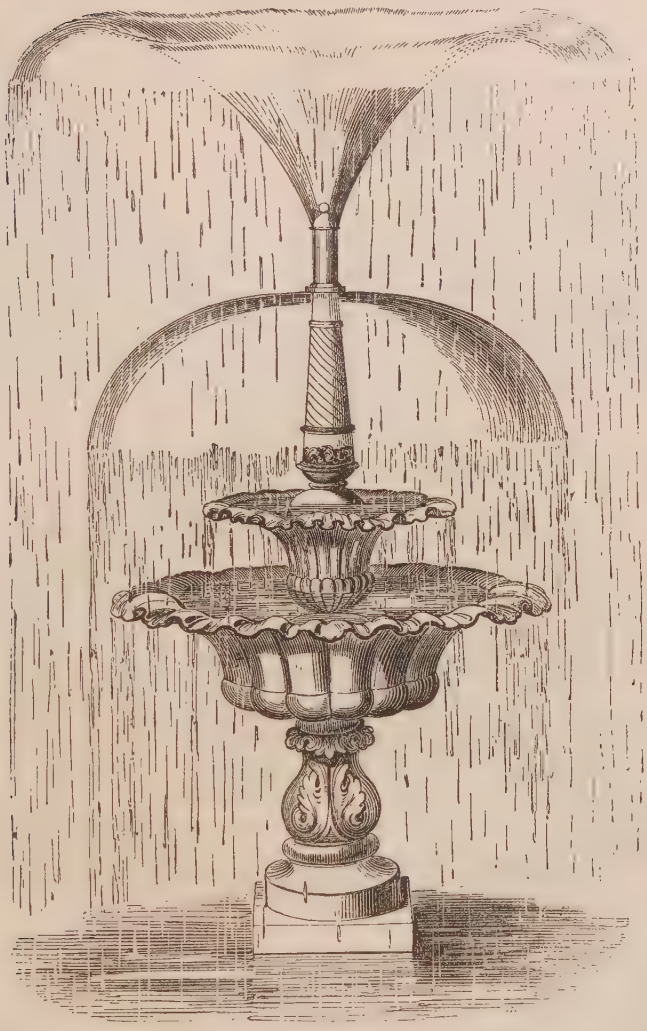
1975. *In conducting the water from the cistern or reservoir to the jet or fountain*, the following particulars require to be attended to: — In the first place, all the pipes must be laid sufficiently deep in the earth, or otherwise placed and protected so as to prevent the possibility of their being reached by frost; next, as a general rule, the diameter of the orifice from which the jet of water proceeds, technically called the bore of the quill, ought to be four times less than the bore of the conduit pipe; that is, the quill and pipe ought to be in a quadruple proportion to each other. There are several sorts of quills or spouts

which throw the water up or down, into a variety of forms; such as fans, parasols, sheaves, showers, mushrooms, inverted bells, &c., or (and which is one of the newest forms) the convolvulus of Mr. Rowley, as shown in fig. 1767. The larger the conduit pipes are, the more freely will the jets display their different forms; and the fewer the holes in the quill or jet (for sometimes this is pierced like the rose of a watering-pot), the greater certainty there will be of the form continuing the same; because the risk of any of the holes choking up will be less. The diameter of a conduit pipe ought in no case to be less than an inch; but, for jets like those in the preceding figures, the diameter ought to be two inches. Where the conduit pipes are of great length, say upwards of 1000 feet, it is found advantageous to begin, at the reservoir or cistern, with pipes of a diameter somewhat greater than those which deliver the water to the quills, because the water, in a pipe of uniform diameter of so great a length, is found to lose much of its strength, and become what is technically called sleepy; while the different sizes quicken it, and redouble its force. For example, in a conduit pipe of 1800 feet in length, the first 600 feet may be laid with pipes of 8 inches in diameter the next 600 feet with pipes of 6 inches in diameter, and the last 600 feet with pipes of 4 inches in diameter. In conduits not exceeding 900 feet, the same diameter may be continued throughout. When several jets are to play, in several fountains, or in the same, it is not necessary to lay a fresh pipe from each jet to the reservoir; a main of sufficient size, with branch pipes to each jet, being all that is required. Where the conduit pipe enters the reservoir or cistern, it ought to be of increased diameter, and the grating placed over it to keep out leaves and other matters which might choke it up ought to be semiglobular or conical; so that the area of the number of holes in it may exceed the area of the orifice of the conduit pipe. The object is, to prevent any diminution of pressure from the body of water in the cistern, and to facilitate the flow of the water. Where the conduit pipe joins the fountain, there, of course, ought to be a cock for turning the water off and on; and particular care must be taken that as much water may pass through the oval hole of this cock as passes through the circular hole of the pipe. In conduit pipes, all elbows, bendings, and right angles should be avoided as much as possible, since they diminish the force of the water. In long conduit pipes, air-holes formed by soldering on upright pieces of pipe, terminating in inverted valves or suckers, should be made at convenient distances, and protected by shafts built of stone or brick, and covered with movable gratings, in order to let out the air. Where pipes ascend and descend on very irregular surfaces, the strain on the lowest parts of the pipe is always the greatest; unless care is taken to relieve this by the judicious disposition of cocks and air-holes. Without this precaution, pipes conducted over irregular surfaces will not last nearly so long as those conducted over a level. We shall here add a Design by Solomon Caus, fig. 1766, which may be described as a conceit, and by no means in what may be considered the best taste. Conceits, however, are sometimes admissible, since they can be enjoyed by those who have not yet arrived at a just feeling for the simple and grand.

1766

1976. *The perpendicular height to which water will rise in a jet* has a limit, depending on the diameter of the jet, and on the specific gravity of the water, and on that of the air which it has to penetrate. A jet of salt water will rise higher than one of fresh water; a column six inches in diameter higher than one of three inches; and a jet of water of any dimension, higher at Madrid or Munich, than in Paris or London, on account of the difference of the elevation of those cities above the level of the sea, and the consequent

1767



difference in the density of their atmosphere. The most powerful garden jet in Europe is that in the Nymphenburg gardens, near Munich. The water is there forced up the jet by the direct influence of machinery, without the intervention of a head or reservoir; and it is found that a column of six inches in diameter cannot, even there, be raised higher than 90 feet.

1977. *Fountains are generally constructed of Stone*, combined with cast iron or copper. In the fountain, fig. 1767, the quill which gives the form to the jet is new, having been lately invented by Mr. Rowley; it is of copper, the double vase with its column is of cast iron, and the basin containing the water is of stone or white marble. In the very elegant fountain, fig. 1768, which is from the pencil of Mr. Lamb, the whole of the part above the water is of cast iron.

1978. *Ruins*, when artificial, are often ridiculous objects, and sometimes highly offensive, from their petty mimicry of what, when real, is grand and venerable. Nevertheless, as picturesque objects, we would in some cases admit of them; for our motto is, let taste be free. Ruins may be introduced where a fitting situation is pointed out by nature, or by tradition or other accidental circumstances; and also where they can be applied to some useful purpose. Where a ruin does exist, we think it may often be allowable to

1768

lighten its architectural character; for example, by adding to the plain walls of an old decaying castle, a tower, a turret, a window with mullions and tracery, or a corbel cornice and embattlements. The use of artificial ruins has been so much abused in England, that the tide of prejudice has for some time set in strongly against their erection; but this does not appear to us a sufficient reason for rejecting them altogether. Now that cement is so universally manufactured, is so cheap, and its valuable uses are so well understood by builders, artificial ruins may be constructed in a very superior manner to what they have hitherto been; and correct imitations of classical edifices, instructive from their Architecture, might be introduced avowedly as imitation, which, besides their historical interest, might serve as useful lessons in art. A ruin of this kind has been erected in the grounds at Shugborough, in Staffordshire; and a ruin in the Gothic style, Radway Grange, fig. 1769, which has deceived many a traveller, has long existed on both sides of the road leading from Banbury, in Oxfordshire, to Kingston, in Warwickshire. It is situated on the brow of Edgehill, the scene of a celebrated battle in the time of Charles I., and may thus be considered to possess a certain degree of historical interest. It was designed by a private gentleman of great taste, the late E. Miller, Esq., of Radway (to whose son, F. S. Miller, Esq., we are indebted for fig. 1769), and was executed by a local mason. Part of this ruin forms a prospect tower, as before recommended, and the habitable part of the remainder is occupied as a public-house, and as dwellings for labourers. In many parks in England, the farm buildings are placed on rising grounds, so as to form conspicuous objects in the views from the house; and their exterior elevations are disguised as ruins, or as old castles partially repaired, as in fig. 1770.

1979. *Rockwork* is one of the most common ornaments of gardens; though few of them

1769

are worse understood. A rockery is too frequently a mere mass of stones of different sizes and kinds, perhaps mixed with bricks, piled together without any attempt at expression or character; in short, more as a nidus for a particular description of plants, than for effect as a mass of visible rock, or as fragments supposed to be connected with a mass under ground. In small gardens this is unavoidable; but in pleasure-grounds of any

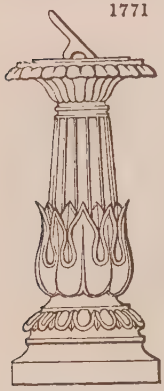
1770

extent the object ought to be the imitation of nature. For this purpose, the artist should first conceive in his mind some description of natural rock, either above the surface, which he intends to imitate; or under it, which he intends to indicate. As the subject belongs much more to Gardening than to Architecture, we shall not here go into details; but one essential point we must mention, which is, that, in all imitations of nature, the stones employed ought to be of the same kind. Stoneries, as they are sometimes called, might be made little geological museums, and contain, besides natural stones, scoriæ, vitrified bricks, broken earthen vessels, architectural fragments, and old roots of trees. One of the best imitations of the face of a rock we know of, is that in the garden of the Colosseum in the Regent's Park, London.

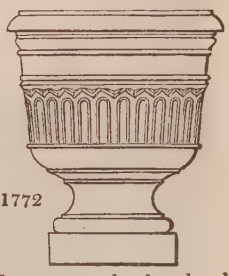
1980. *Statues* in the open air are objected to by some, as unsuitable to our climate; and by others, as a practical absurdity. How ridiculous, say such persons, it is to place imitations of human beings on posts and pedestals in the open air, exposed to all weathers! The proper answer to this last objection is, that it would be still more ridiculous to place them only in warm rooms. Statues are to be considered as works of art, among other works of art; and there seems no reasonable objection to placing them anywhere among works of art of the like kind; such as those of Architecture, an art the productions of which have been in all ages closely associated with those of Sculpture. Whenever architectural ornaments are introduced in a garden, therefore, we see no objection to including among them statues and other sculptural articles, where the materials of which these are made are of a nature sufficiently durable. There is nothing in the way of garden ornaments which we are more desirous of seeing introduced than statues of cast iron, and we are persuaded that the time is near at hand when statues of this material will be cast in one piece. Our patriotic correspondent, Mr. Robison, has lately

produced an interesting article on this subject, in *Jameson's Journal*, vol. xiv. p. 364. Messrs. Cottam and Hallen have also lately had vases of a great variety of sizes, with and without ornaments, cast in iron in one piece, so as to sell at very low prices.

1771



1981. *The Disposition of Statues, in Architectural Gardens*, is a matter that requires much taste and feeling; and it would occupy too much space to lay down either principles or rules for it. As a general guide, we would suggest that no statue ought ever to be placed where it may not be viewed in connection with some architectural production; such as placed on the piers of a balustrade, on the side walls of a stair, or simply on pedestals among flowers; but so as always to have a spreading architectural base, and to be seen backed by a wall, or some part of a building.



1772

Statues may also be placed where they are seen in connection with each other; though even this will not be entirely satisfactory without some mural appendages. Statues placed in woods, in green arbours, verdant alcoves, in the midst of naked grass lawns; or, in short, in any place where they are surrounded only by vegetation, are, from their want of harmony with the scene, decidedly objectionable. The streets, squares, and market-places of cities are indeed the true situations for statues; next to them, the exterior elevations of edifices of any kind; and, next to these, architectural gardens. The subject of indoor sculptures is not here under consideration.

1773

1982. *Busts, Therms, Vases, Urns, Sundials*, and similar architectural and sculptural objects, are subject to the same laws as statues. Busts alone are more adapted for decorating the walls of an edifice, than for being placed on the walls or piers of a garden; but, when they are placed on therms, they then approach more nearly to statues, and may be treated like them.

1774

The difference between a vase and an urn is, that the latter is always a covered vessel. The vase, being an open one, has frequently soil and a plant placed in it; but this, in the great majority of cases, and at all events in the case of all sculptured vases, we consider to be in bad taste. It is reducing a work of art to the level of a mere garden flower-pot, and dividing the attention between the beauty of the form of the vase, and of its sculptured ornaments, and that of the plant which it contains. Two kinds of beauty so different cannot be felt, examined, and enjoyed by the mind at the same time; for unity is the essential principle of every work, the end of which is to please. It is seldom, therefore, that vases, when used architecturally, can, with propriety, be made to serve as flower-pots. The Italians sometimes employ them in this manner, but not always with a proper effect. The least objectionable cases are those in which, on the pier of a gate, a vase contains that stiff architectural-looking plant, the American aloe; and so sensible are the artists of Italy of the superiority of this plant to most others in such

1775

1776

1777

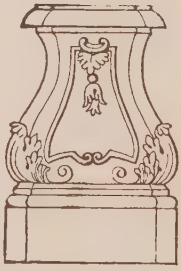
a situation, that imitations of it are commonly made of copper and painted green; in order that the plant may appear always to remain of the proper size, and retain its proper architectural shape. A sundial is one of the most agreeable and useful of architectural appendages, and in this country is become venerable, as a piece of garden furniture. Its situation should always be central, and where it can be walked round, and viewed on every side. There are many elegant forms in artificial stone by Coade and Seeley; and also by Austin, fig. 1771; in pottery, by Peake; and in cast iron, by Cottam and Hallen. Figs. 1772, 1773, 1774, 1775, 1776, and 1777, are vases of Austin's artificial stone. Figs. 1778, 1779, and 1780 are urns of artificial stone, also by Austin, and, with the vases of the same artist, are well adapted for decorating parapets, walls, or other architectural objects in gardens. Fig. 1781 is a pedestal of Austin's artificial stone, on which may be placed either vases or urns.

1778

1779

1780

1781

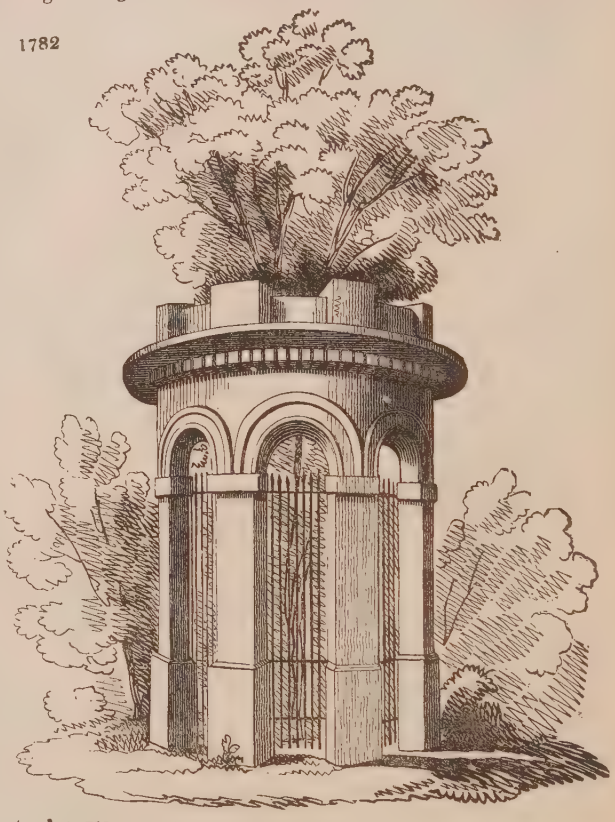


1983. *Grottoes, Root-houses,* and similar structures, were formerly common in English pleasure-grounds. The idea of a grotto in a British garden is of Italian origin; as in Italy the grotto, in the summer season, is frequently the family dining-room. In Britain they are generally damp, unwholesome places, fit only to be glanced at in passing through. However, they add to the number of interesting objects of a demesne; and, in certain stages of society, grottoes, like many other objects, may form appropriate overflowing places for superfluous wealth. The same may be said of root-houses and other rustic structures; which, in landscape gardening, may be compared to tapestry and other ancient needlework in furnishing, or the elaborately enriched ornaments of Gothic Architecture in the old cathedrals. In an enlightened age, labour employed in this manner will be considered as in a great measure thrown away. The same observation will also apply to the rustic stands and vessels for plants, formed of roots, bark, and pieces of branches, which are found scattered about in various pleasure grounds, often to the utter destruction of harmony and repose. They no doubt serve to amuse the proprietor, and to employ labourers; but the same labour, bestowed on a more durable material, would be equally beneficial to the labourer, and much more advantageous to the public. But the possessors of wealth must be free to spend it as they choose; and therefore all that an author, writing on the subjects now treated of, is entitled to do, is, to state his opinion, and his reasons for having formed it, with a view to the improvement of the general taste. Decidedly the best grotto in England is that at Pain's Hill, Surrey.

1984. *Trelliswork* is a frequent ornament in gardens; and, in many cases, forms a useful structure for training climbing plants on; for forming a shady arcade; or for clothing a naked wall. In ancient geometrical gardens, it was customary to form arbours entirely of trelliswork, and to cover them with vegetation, so that the carpentry or iron wire forming the trelliswork became a mere frame for the plants. In this case, it ceased in a great measure to be considered an architectural object, and might be set down in any situation where a seat was desirable. The employment of trelliswork as arcades to connect one scene with another is very frequently overdone: there is nothing either grand or beautiful in walking under such an arcade, covered with a thick roof of unpruned plants, with their decayed leaves or twigs; or with the sickly green appearance in their leaves and young shoots which is the inevitable consequence of the want of direct light. On the other hand, where the plants covering a trellis

are vines, annually pruned, and the locality is such that grapes will ripen in the open air, the effect is good; as every one knows who has walked under such trellises on the Continent. The hardy fruits of Britain, gooseberries, currants, apples, plums, &c., trained on trelliswork, and properly pruned, have a very good effect, and afford convenient modes of eating the fruit from the tree, agreeably to the practice of the possessors of villas in Holland and other places on the Continent. It was also the custom, in the ancient style of gardening, to form skeletons of trelliswork, in the shapes, architectural or sculptural, into which it was desired to clip the trees or shrubs. The plants intended to form the figures, statues, or other architectural forms, or green walls, being planted within the trellis frame, all that the gardener had to do was to cut off such branches as obtruded themselves beyond it. On the whole, trelliswork in gardens is to be considered more with reference to floriculture and horticulture, than to landscape Gardening or Architecture.

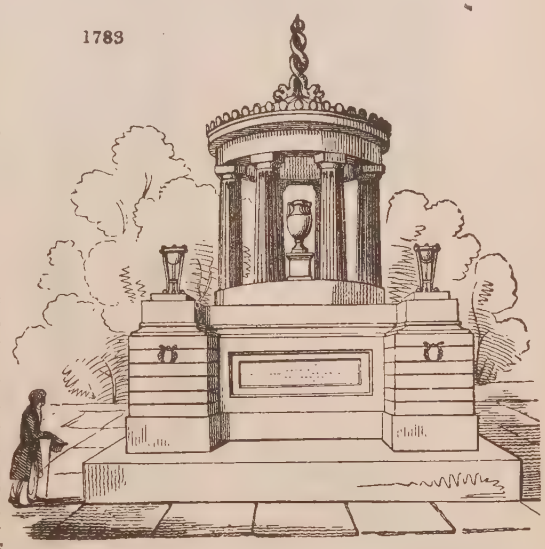
1782



1985. *Sepulchral Structures* are frequently erected on the grounds of villas. As cenotaphs, or memorials of the dead, and as enclosing and marking, in a particular manner, a place of burial, they are worthy of respect; but an architectural tomb, in which the remains of human beings are built up, and prevented from mixing with our mother earth, is a structure indicating a practice altogether unworthy of an enlightened age. Far preferable, in our opinion, was the grave of Thomas Hollis, Esq., of Corscombe in Devonshire, one of the most worthy and most benevolent of men; who ordered his body to be buried in one of his fields, and the field to be ploughed immediately afterwards, that the precise place of his interment might not be known. Cenotaphs, which may be considered as monuments, and not as tombs, may often find a place among the architectural decorations of pleasure grounds, and they may vary in magnitude and style, from a simple block or a tablet of stone, to a Grecian temple or a Gothic tower. In America, it is very common for families living on their own estates, at a distance from towns, to have their "grave-yards" generally in an orchard near the house. They are simple enclosures, to exclude cattle or other animals, and to convey the idea of consecration. A simple and elegant manner of en-

closing such burial-places would be by a circular arcade, the arches being open from the foundations to the soffits, in order to admit of the spreading of the roots of trees and shrubs in the soil, whether planted inside or outside, and the free circulation of air and the weather. The openings may be filled in with iron palisading. Fig. 1782 is a perspective view of a Design of this sort, made, at our request, by Mr. Lamb; and fig. 1783 is a Design for a Grecian cenotaph by the same author. Fig. 1784 is a cenotaph in the Gothic style, also by Mr. Lamb. The Design, fig. 1782, might be greatly simplified, and still have an excellent effect; perhaps better than it now has. The circular form is so beautiful in itself, and the repetition, at equal distances, of the uniform-sized semicircular-headed openings, produces an effect at once so simple, so grand, and so much in unison with the general form, that the whole of the mouldings, the impost stones, the cornice, and especially the breaks in the blocking (which last are in fact a deformity), might be dispensed with. For our own particular taste, we should prefer such an enclosure to a burial place, without a single ornament of any kind; retaining none of the architectural lines in the figure before us, but those showing an enlarged basement or plinth. If the walls were raised on secure foundations, and built of brick laid in Roman cement, they would last for thousands of years; the ironwork would no doubt fail, but, if a holly were planted in the centre (and this tree, which forms a conical head, is far more suitable for such a building than that shown in the figure), its branches, long before that took place, would spread out from all the openings, and form an adequate defence, without the necessity of rails.

1783



1986. *The subjects slightly noticed* in the preceding paragraphs of this section being principally those which connect Villa Architecture with Landscape Gardening, their treatment belongs as much to the one art as to the other. As we contemplate a separate work on Landscape Gardening and Garden Architecture, we have not considered it desirable to discuss these subjects more at length in the present volume, it being already sufficiently expanded by those which it was more especially intended to include.

Sect. IX. *Entrance Lodges and Gates.*

1987. *The Entrance Lodge and Gate to a Villa* may either form one architectural composition; or the lodge alone may display architectural style, and the gate be of a very simple inconspicuous construction. In the former case, the principle of unity seems to require that the style of the lodge and gateway should correspond with that of the house to which they belong; but in the latter case the necessity for this principle is not so obvious, and, provided the gate be without conspicuous piers, and be kept altogether subordinate, the lodge may be in any style. This style, as Mr. S. Gilpin has remarked (*Practical Hints on Landscape Gardening*, see *Gard. Mag.*, vol. viii. p. 700), may be determined by some peculiarity in the situation; to which we may add, or by any peculiarity of taste in the owner.

1988. *When the Lodge and Gate form one Composition*, it is essential that the piers be rendered architectural; because on them mainly depends the union of the dwelling with the gate. There are various ways in which this is to be accomplished; by detached stone piers; by a single arch thrown over the roadway, and only connected with the lodge by an intervening foot-gate; by two, three, or more arches; by columns united by an architrave; or by the most effectual method of all, that of having a lodge on each side of the road, and forming them into one architectural whole, by a colonnade or arcade

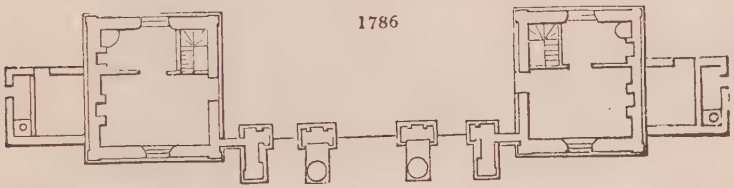
carried across it. These being the general principles, and the rules derived from them, a very few examples will serve to illustrate their application.

Fig. 1785 is a view of a double Roman lodge: we call it Roman, because it contains columns superadded to the archway. The ground plan of this lodge, fig. 1786, shows a dwelling consisting of a kitchen, scullery, two bed-rooms, and other conveniences, on each side of the road. Though this lodge was contributed by a very eminent Architect, we cannot bring ourselves to approve of the columns in the piers, on account of the large intercolumniations, and the consequent idea of weakness produced by such a length of architrave. It is true that the Romans introduced columns in this manner in their triumphal arches, but they did not carry the architrave through from one column to the other; by which means, though the column was degraded to a mere ornament, yet no appearance of weakness was produced. Whoever wishes to see, from an existing example, the bad effect, when executed, of columns and architraves arranged as in the Design before us, has only to look at the new gates leading into Hyde Park from Piccadilly. Neither in this Design, nor in the gates of Hyde Park, can the architrave be formed of a single stone; in the Design before us, the stone would require to be thirteen feet six inches long, and in the Hyde Park gates several feet longer. No doubt, such stones are

1785

to be obtained; but the expense would, in scarcely any case, be justifiable by the object

1786

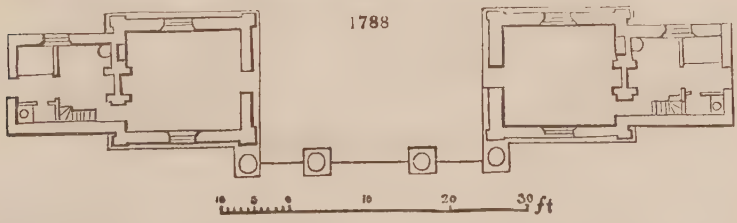


on which it was bestowed. Fig. 1787 is an elevation of a double lodge, in the Doric style; and fig. 1788 is the ground plan, showing the same accommodation as in the last

1787

Design. There can be no objection to the Architecture of this Design, so far as it goes; but, like the preceding one, it wants chimney-tops; and we do not see by what means

1788



access is to be had to the bed-room; for, even supposing the appendages containing the scullery, &c., to have flat roofs, there cannot be headroom to ascend by them into the

bed-room. There can be no doubt that this is a mere oversight in our contributor which it is easy to correct by placing the stair in the living-room.

1789

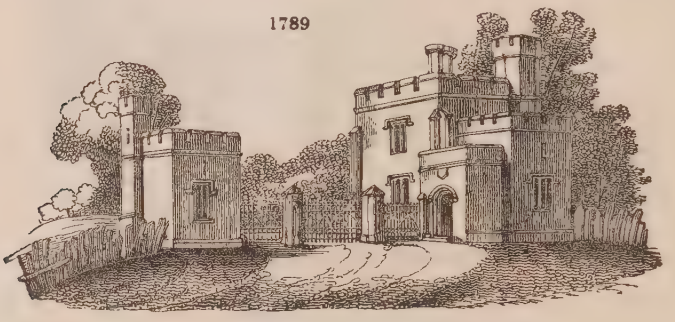


Fig. 1789 is a view of an architectural lodge in the castellated style; and fig. 1790 is its ground plan. In the latter, the small building to the left is for coals; the dwelling contains a sitting-room and scullery on the ground floor, and three bed-rooms over.

1790

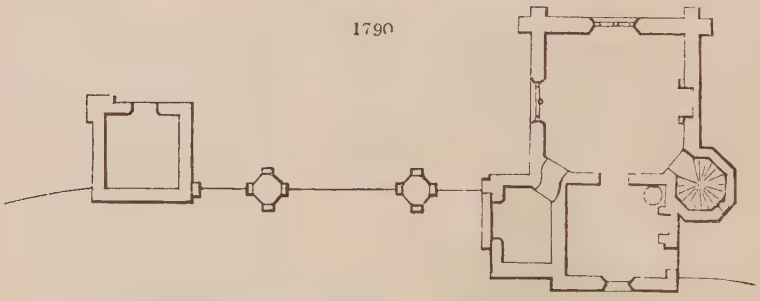


Fig. 1791 is a view of a castellated architectural lodge; and fig. 1792 is its ground plan. The effect of this Design and the preceding one is good: in the latter, there is a degree of symmetry, combined with variety, which is highly pleasing, and, at the same time, there is nothing which is at variance with the laws of strength, or offensive to reason or good sense.

1791

1989. *When the Lodge is independent of the Gate*, and does not form an architectural composition with it, the gate-posts should be inconspicuous, and at some little distance from the lodge; at all events, never attached to it. We shall give three examples of lodges of this description.

1792

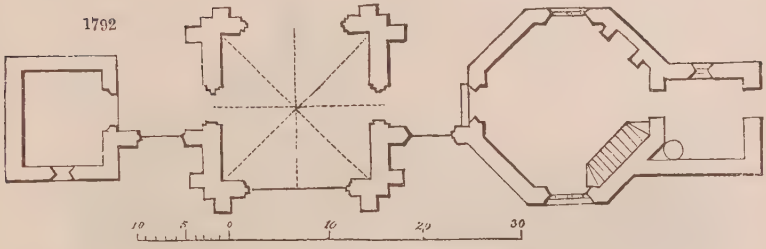


Fig. 1793 is a view of a lodge in the Grecian style; and fig. 1794 is its ground plan, in which the line of fence, *a*, and the gateposts, *b*, are shown at some distance from the

1793

dwelling. The view is taken from the interior of the park; and the gateposts, though of masonry, and forming with the trees one general composition with the lodge, are yet not architecturally connected with it, and do not form an architectural composition.

1794

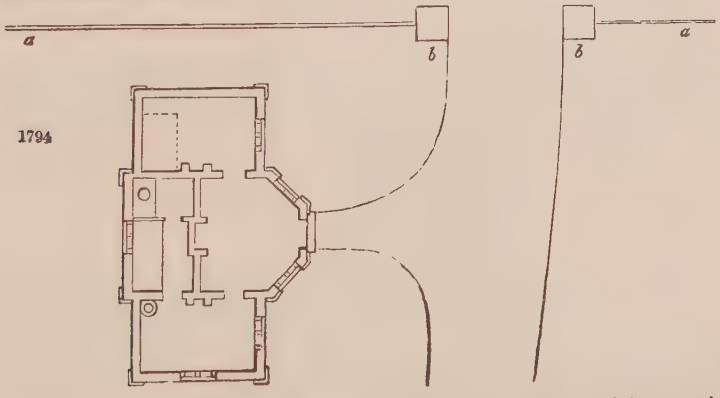
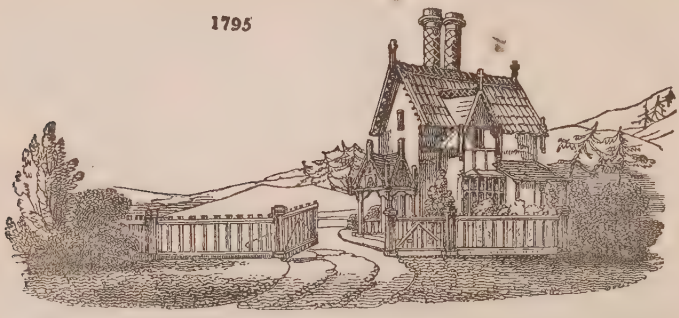


Fig. 1795 is a view of a Swiss cottage as an independent lodge; and fig. 1796 is its ground plan. It will hardly be supposed that a cottage of this description could lead to a villa in the same style; because the style itself is not adapted to large buildings. The preceding Design, however, being in a style of Architecture adapted to large buildings, might very reasonably be considered as a prelude to a Grecian house. The preceding six Designs are by the distinguished Architect who contributed to us the plan of his own villa, Design III. § 1746.

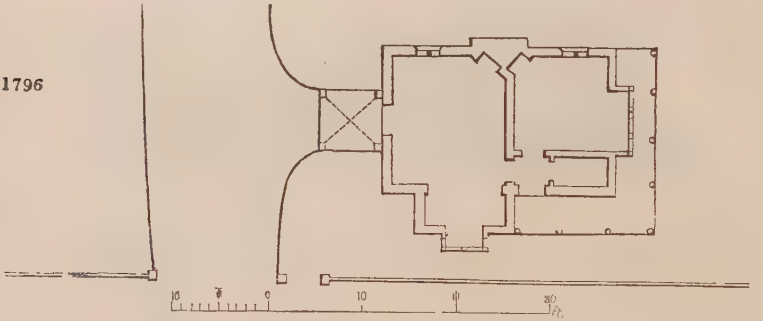
Fig. 1797 is a geometrical elevation of a cottage lodge in the Old English style; and fig. 1798 is its ground plan. This Design, having two porches, *a*, *b*, would form a very excellent lodge for placing between two gates, to two small villas; a practice which is sometimes adopted in the neighbourhood of large towns. There is a bench, *c*, placed outside, which serves as an apology for the canopy which projects over it, and which adds to the harmony of the elevation. The tiles of the roof, it will be observed, are of different forms, arranged in the manner recommended by Mr. Varden, § 759. This Design is by Mr Lamb, and would suit his very elegant Gothic villa, fig. 1646.

1795



1990. *Entrance Gates to Villas* are constructed either of iron or wood; and the lines which prevail in them should be those of the mural Architecture to which they belong The wrought-iron gates of the age of Louis XIV. were highly enriched with foliage and

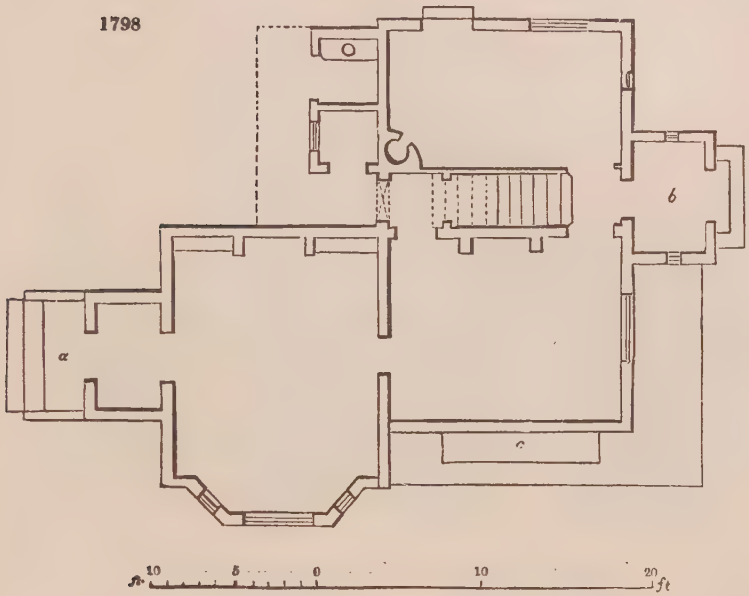
1796



flowers; and those of modern times, formed of cast iron, are still more so. The richest metallic gates in the world are those of Tuscany, and especially of the cathedrals of Pisa and Florence, formed of brass. Some of the gates in British cathedrals, for example in Henry VII.'s Chapel in Westminster Abbey, are also highly enriched. The iron gates

1797

1798



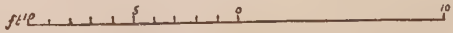
at Leeswold, in Flintshire, are among the most celebrated in England: they were erected under the direction of Switzer, and will be found figured in the works of different tourists. An excellent work on Roman Gateways, by Donaldson, contains many beautiful designs adapted for towns; and Robertson's *Gate Lodges* affords resources for the Villa Architect. Some elaborate designs for wrought-iron gates, which have been executed at Nancy, are engraved in the *Recueil des Fondations*, &c., of that city; and some others will be found in Vingboon's *Architecture*, and in that of Dietterlin. A number of rich designs executed in cast iron are common to the Birmingham trade, and may be examined, together with many original drawings, in the pattern books of Messrs. Cottam and Hallen. The most elaborate cast-iron gates in England are those of the triumphal arch, which forms the entrance to the Green Park from Piccadilly; they are bronzed, and, at all events, are excessively rich, as are the cast-iron railings of the same kind flanking the entrance into Hyde Park. These cast-iron gates and rails are bronzed, which is a very suitable kind of colouring for them. In the palisading to the gardens of the summer palace at Petersburgh, is a description of iron railing combining elegance with magnificence, in which the ornaments are gilt; but which are not so abundant as to be no longer considered as such. In the English gates the ornaments cover the whole.

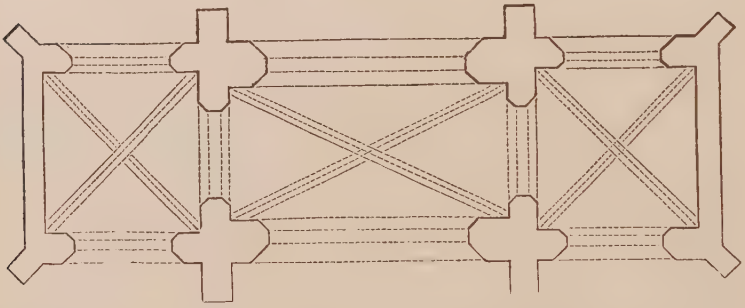
Fig. 1799 is an elevation of a Gothic gateway in the style of Pointed Architecture, prevalent during the time of Henry VII. It was furnished to us by Mr. Lamb, who observes that "the arms of Henry VII. are used in the decorations to mark the date of the style of Architecture. Such heraldic devices are peculiarly appropriate to the Gothic style of art, and lend it great interest in a moral point of view, by marking the consequence of the proprietor, and serving as a sort of index to the style of living which may be expected at the villa, or baronial castle, to which they lead." In ages when mankind were nearly on a par with regard to intellectual rank, distinctive marks of this kind became requisite, not only to wealthy individuals, but also to professions: hence, while the warrior was known by his arms, the priest was distinguished by his gown, and the lawyer by his wig; even physicians, till lately, carried with them gold-headed canes, and they still wear black clothes. All these distinctions, even the bearing of arms, which will be the last to pass away, will disappear with the universal diffusion of education.

Fig. 1800 is a design for a Chinese gateway, copied for us, from a Chinese drawing, by Mr. Varden. The Chinese sometimes adopt an opening of the form of three fourths of a circle as a gateway, which may be considered a caprice; a doorway, the opening of which is of the form of an egg, with the broad end uppermost, and the lower end cut off, is a better approximation to the human form.

Fig. 1801 is a Design for a Grecian gateway, by Mr. Lamb; it may be supposed to

1799

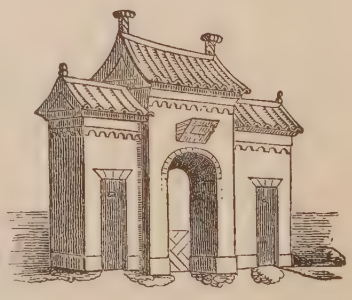




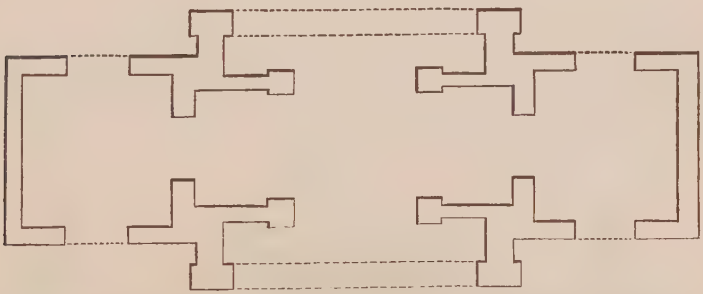
be the outer entrance to Mallet's Palladian villa. It would also suit very well for the gateway to a public garden or park.

Fig. 1802 is an iron gate between stone piers. We have introduced it for the sake of showing what we should call a gate utterly without taste, such as we might suppose a blacksmith would design, who had few ideas beyond the mechanical part of his profession; and who, in the figure before us, may be supposed to have looked only to the arrangement of the bars and braces, in such a manner as to make them rivet readily together, and produce a strong whole. What he would consider as beauty in this work would be the curving of the secondary diagonal struts; and he might, perhaps, expect admiration for the contrivance of the latch. How different the effect of such a gate, in an architectural point of view, from any of the preceding ones. In figs. 1799 and 1801 the lines of the gate cooperate in the production of a whole, in which there is a unity of direction in the lines, as well as of their kind. The gate before us, fig. 1802, would even have had a better effect, as a work of taste, by the omission of the curved diagonals,

1800



1801



which add nothing whatever to the strength of the gate. The straight diagonals do add strength, and one of them is essential to each gate. Had only one been admitted, as in

1802

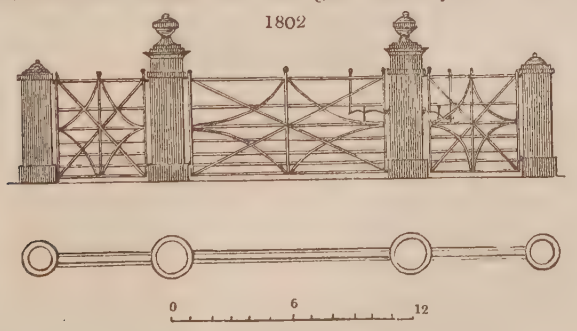
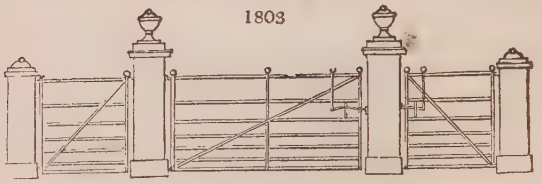


fig. 1803, the whole would have been in much better taste, because it would have been without pretension, and without offence.

Fig. 1804 is an elevation of a carriage and two footway gates, designed by John Perry, Esq., and erected, under his superintendence, at Denbighs, near Haslemere, Surrey. We have introduced it here, chiefly to show the manner of fixing wooden gates in the country. In this figure, *a*, *b* are the ground plans of the posts; *c*, *d*, a plank or beam sunk in the earth two or three feet under the surface, into which the posts are

1803



mortised, and supported by angle braces, *e*. By means of this horizontal sleeper or beam and these braces, the gate-posts are kept perfectly erect and firm.

1804

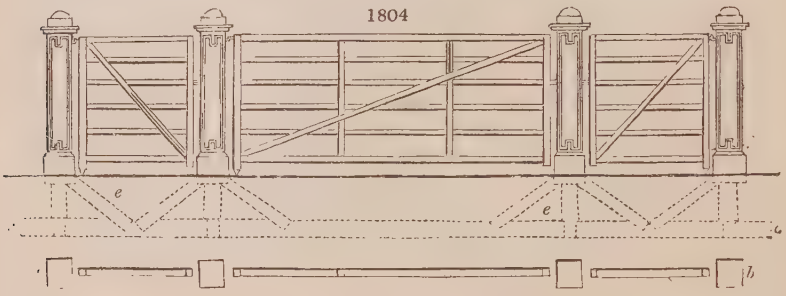
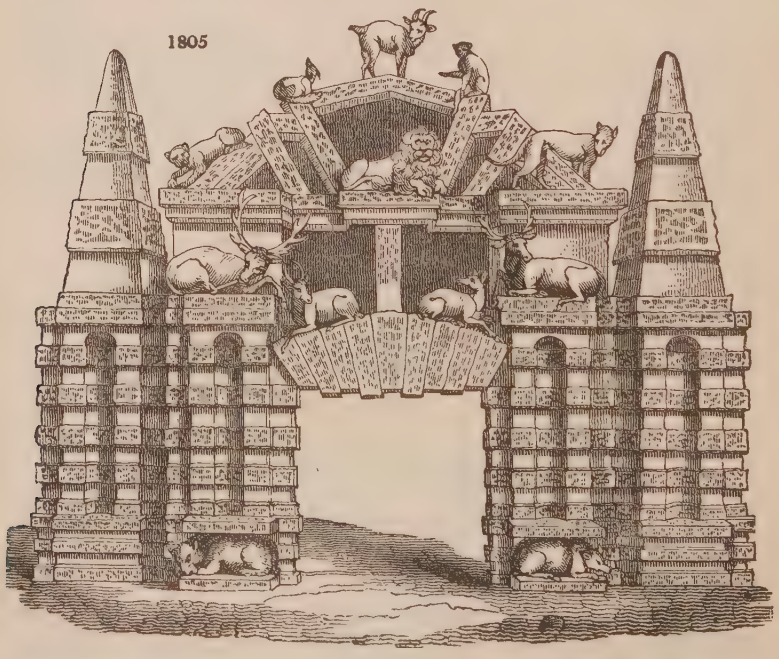


Fig. 1805 is a Design for a gateway to a menagerie, from the work of Caus, which was intended by him to be executed as an entrance to the grotto, in the gardens at Heidelberg, which he laid out for the Elector Palatine, afterwards king of Bohemia. It may be considered as an extravaganza with reference to the grounds of villas, but would suit very well for a garden containing a zoological collection, such as it is to be hoped will soon become appended to all our cities and towns.

1805



Chap. V.

Of the Finishings, Fittings-up, Fixtures, and Furniture of Villas.

1991. *In studying the Subject of the Finishing of Villas,* the reader will take into consideration, with the first two sections of this chapter, what is stated in the first two sections of Chap. III. of Book I. p. 258, and also Section VI. of Book II. p. 650. The fixtures, fittings-up, and furniture of villas may in like manner be elucidated by reference to those of cottages and farm-houses; and the reader should, therefore, turn to the sections in our second Book treating upon these subjects, the references to which he will find in the Table of Contents, or in the General Index.

Sect. I. *Of the Exterior Finishing of Villas.*

1992. *The Exterior Finishing of Villas* may be considered with reference to architectural style, and to general decorations applicable to all styles: the former includes the projections, mouldings, lines, and forms which belong to each system of Architecture; and the latter such ornaments as statues, sculptures, &c., which may be introduced into elevations in any style or manner.

1993. *The Display of Architectural Style in the Exterior Finishings of Villas* may be obviously carried to a greater extent than in cottages, farm houses, or other dwellings of an humbler and less expensive description. In a cottage, for example, the windows are often left without architraves, or exterior facings; but in a villa these should not be omitted, unless in styles where some other mode of finishing is substituted. The entrance doors to villas ought never to be without porches or porticoes, and these should be of a more imposing and architectural character than those employed in cottages. Where the roof is concealed by a blocking course or parapet, the latter may be rendered ornamental by a balustrade, or by other open work, the piers of which may be terminated by vases, or other sculptural ornaments. Blank windows, that is, openings in the shape of windows, without glass in them, or without some other object that may leave no regret that glass is wanting, we hold to be inadmissible, in either a cottage or a villa; but, in a villa, blank windows are more especially objectionable. In cottages and farm houses, the walls may be of mud, of rubble-stone, of coarse bricks, or of some comparatively cheap material; but in villas the material ought always to be of a durable kind, and also, if possible, of an agreeable or ornamental character; stones ought to be squared, or, if rubble or coarse bricks be used, the wall should be covered with cement, finished in the manner of squared stone. The guiding principle in all this is, that, a villa being a dwelling of a higher class, there ought to be a higher quality of building material used in its construction, and a higher degree of architectural style displayed in its elevation.

1994. *The Exterior Decorations of Villas* which are common to different styles are chiefly, statues, sculptures, vases, urns, and other ornaments of stone. Exterior window blinds may also be included in this division of exterior finishing; in addition to the various objects common to different styles, mentioned in preceding sections.

1995. *Statues and Sculptures,* as we have already observed, have at all times, and in all ages and countries, been associated with Architecture; and, indeed, in rude ages, as is still the case in remote districts of country, the occupations of the mason and of the sculptor are generally found united in the same person. There can, therefore, be no more appropriate ornament to the exterior elevation of a house than statuary works; and this every one must feel who is capable of deriving pleasure from either sculpture or Architecture. A correct feeling or taste, and a sound controlling judgment, however, are necessary to guide the Architect in the disposition of statuary work. This disposition, as in similar cases, ought never to be left to the sculptor, who, from the feeling for his own art inseparable from artists, will be too apt to limit his views to his productions, instead of taking a comprehensive view of the effect of the whole. In the disposition of statues, either on the summits of the walls of a house, or on its pediments, porticoes, and porches, the Architect must chiefly be guided by the general principles of composition, though in some degree, also, by the style of Architecture which he has adopted. For example, in the Grecian style, it is most common to place statues where they will be seen backed by the sky, by some part of the building, or by the scenery surrounding it; whereas, in the Gothic style, they are chiefly placed in niches. From the nature of the art of sculpture in entire relief, or statuary, which is altogether unsuitable for representing motion, groups of figures can seldom be used with effect in exteriors, except in those sculptures which are called in alto, or in bas relief. Not only single statues are to be preferred but single statues in attitudes of repose; never in attitudes implying motion, as in the Discobolus, which, though an antique statue, is essentially in bad taste. We may also notice, in this place, an error pointed out by Mr. Hope, which English sculptors,

he says, have fallen into, in imitation of the French sculptors of the last century. This is, the practice of representing in a bust, the head, not looking straight forward and in the same direction as the chest, but turned over the shoulder, and looking sidewise. The reason why this is wrong is, that "in the production of the pencil, which can only exhibit a face in a single aspect, if the most striking or most favourable view of that face be not a direct front view, there may, in the eligibility of bringing the features more in profile, be a very good reason for turning the head somewhat over the shoulder. Nay, even in a work of the chisel, if it be an entire statue, the peculiar attitude or action of the body may present a sufficient motive for giving such a turn to the head. But if a mere bust, which we may easily view in every possible aspect, by ourselves moving round it, in place of being allowed to leave this task entirely to the beholder, be made itself to turn its face away from our sight though it have not a body, to account for this less easy and less usual position of the head, the portrait loses all claim to naturalness and truth; it forfeits the appearance of dignified simplicity, which is so essential and so fascinating, for an air of inane and pompous affectation; and it, moreover, from the different direction given to the face and to the chest, can seldom be so situated as not to look ill placed and awkward." He adds, "that the Grecian method of cutting the chest square, and placing its whole mass immediately on a term or other solid support, seems much preferable to the more prevailing Roman fashion of rounding off that chest, and balancing its centre only on a slender and tottering pivot." (*Designs for Furniture*, p. 47.)

1996. *The Proportion between the Height or Size of the Statue*, and that of the height and size of an ordinary human being, is a point which has given rise to much discussion. The most eminent authors are agreed that there ought to be a certain proportion between the size of the statues and sculptures on a building, and the size of that building; and that the size of ordinary life is generally too small for interiors, and always so for statues placed externally. This seems but reasonable, and in harmony with the practice in all buildings, of forming the doors and the ceilings of rooms higher than is necessary for the reception of human beings. No fixed rule or proportion has hitherto been given for determining the height of statues relatively to the height of windows, doors, and other openings; and all that has been suggested by the best writers on the subject is, that there should be some general proportion between the height of the statue and the magnitude of the building. For example, a villa of the ordinary size of villas in the given age, country, and style of Architecture, should have the statues used in decorating its exterior, somewhat, perhaps from a seventh to a fifth part, larger than life; and a villa much larger than the common size of villas ought to have the statues proportionately larger than life. This point, like various others, may be considered as beyond the reach of rules; the principle is clearly the idea of union with the building in forming a whole; and this includes union in size, as well as in expression, material, and style of workmanship.

1997. *The Style of Statues* should correspond with the Architecture of the elevation on which they are employed; and there ought to be even a historical relation between them. For example, in a highly finished Grecian elevation, the statuary ought to be simple, classical, and highly finished; in a bold Italian elevation composed of coarse materials, and producing its effect by strong contrasts of light and shade, the statues may be rudely chiseled, so as to produce effect rather by their general form than by minute details; and the statues on a Gothic building, in which perpendicular lines prevail, should exhibit a preponderance of lines of the same character, in the folds of their drapery, &c. Historically, Grecian buildings ought to have Grecian figures, in the costume employed by the Grecian sculptors; and the subjects ought to be heathen gods and goddesses, or the heroes and great men of antiquity. The statues for decorating Italian elevations may be those of eminent men of modern times. Gothic buildings ought to display statues of men distinguished for their military gallantry or for their devotion; while a cottage, being comparatively a temporary structure, may, where a statue is admitted, copy the costume of the times in which it is built, and of the particular country from which its own style is borrowed. A Swiss cottage, for example, might be decorated by a figure in Swiss costume carved in oak, and protected by a projecting canopy. We offer these remarks, not as absolute, but rather to excite reflections on the subject in the mind of the young Architect.

1998. *Sculptures in high or low Relief* are of far more general application to the external elevations of buildings than statues; and, indeed, they may be said to be, to the exterior surfaces of walls, what paintings are to the walls of rooms. Wherever there is a blank window that it is not desirable to disguise by a glazed sash, it may be filled in with sculpture; the boundary line of the opening forming a frame, and the subject appearing as though in a sunk panel. The size of the figures for sculptures of this kind ought to be governed by the same principles as outside statues. Historically, we think, some subject ought to be chosen relatively to the occupants of the building, rather than

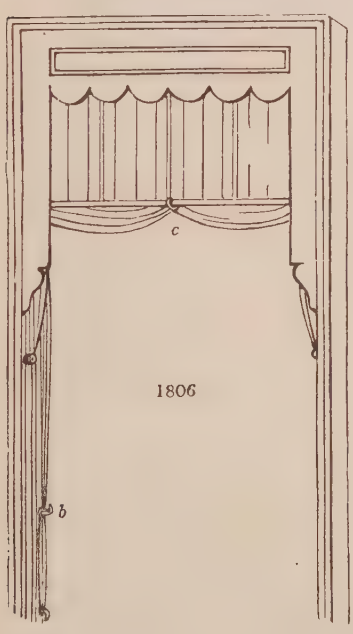
to persons or things foreign to it. For example, in one window, figures might appear as if looking out at some object, and conversing about it; another window might represent part of the interior of a room with its occupants, and, indeed, where the panels or false windows filled with sculpture are numerous, they might indicate the uses of the different descriptions of rooms within. Thus, one blank window might represent some characteristic of a dining-room, another of a library, or of a drawingroom, a staircase, &c. This is in perfect accordance with the original uses of sculptures in low relief, which, according to Quatremère de Quincy, were originally a sort of writing, or hieroglyphics, or signs; and came at last to be improved into classical compositions.

1999. *Where Sculptures in relief* are to be placed in panels so much smaller than windows as never to be mistaken for them, the size of the figures may be proportionably small. Reliefs of this kind may be classed with those employed by Architects in decorating friezes; and they may be introduced with excellent effect in a variety of positions, where it is desirable to enhance the interest of a particular part of the elevation or to oppose great richness of decoration to simplicity of form. Even single portraits, in the manner of alto relievo busts, may be introduced in some parts of the exteriors of buildings; such as over an entrance door, over windows, in the tympanum of pediments, in gable ends, &c.

2000. *Armorial Sculptures* are particularly suitable for the different varieties of Gothic Architecture, and in no other style can so much interest be created with so little exertion of skill or expense. The simple form of the shield, which any mason can execute, has alone, from the train of historical associations connected with it, a powerful effect. The cross, whether in complete or in partial relief, is also an object of great interest in the Gothic style. The same may be said of the fleur de lis, and other forms used in armorial bearings.

2001. *Other Decorations*, such as vases, urns, chimney-tops, tiles, rusticated stones, and sculptured bricks, or weather-tiling in imitation of bricks, have been already sufficiently noticed in preceding sections.

2002. *The Subject of outside Blinds* has also, § 554 to § 560, been treated of; but we shall here describe the mechanism of what is considered the best description of cloth outside blind. Fig. 1807 is a view of a bonnet blind let down as far as it will go, the lower

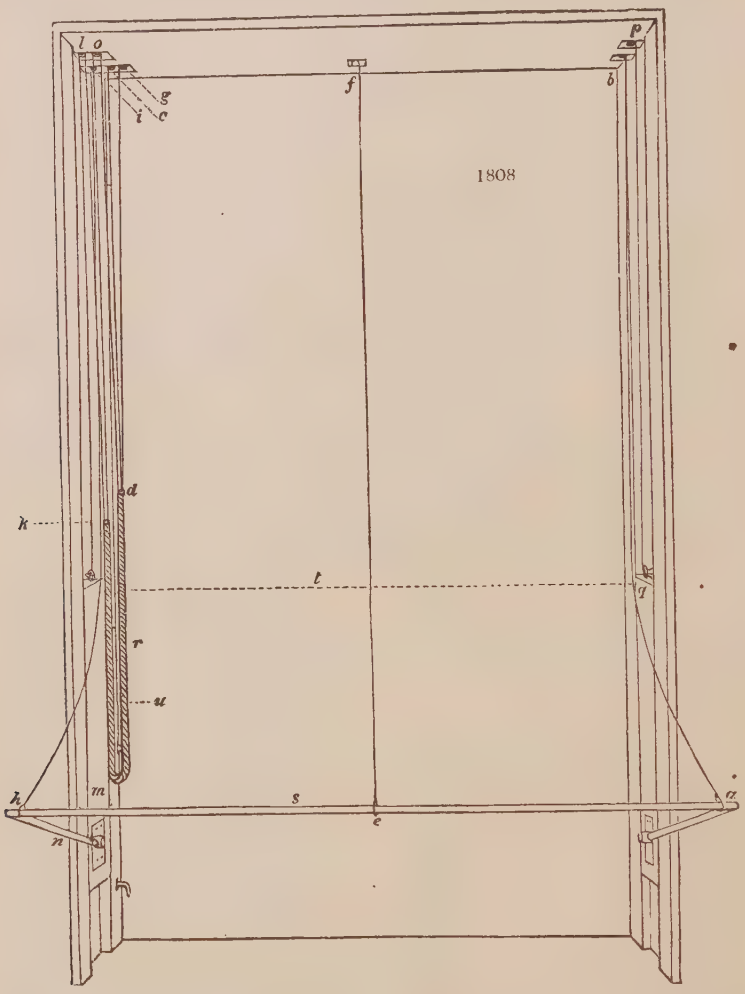


1806

1807

and projecting part being what is denominated the bonnet; and fig. 1806 a view of the same blind drawn up nearly to the top. In the former figure, *a* represents one of the

hooks for fastening the cord to when the blind is pulled up; the other hook being a little way above it, as shown at *b*, in fig. 1806. It will be observed that the hood or bonnet is confined by the line and rod shown at *c*, in the same figure; the line serving to draw up the curtain. Fig. 1808 is a skeleton view of the interior of the blind; in



which *a* is one of the lines by which the hood is raised: it is attached to the front iron of the hood, passes over the pulley *b*, proceeds along the top of the lath, passes over the pulley *c*, and joins the other lines at the knot *d*; *e* is the second line of the hood, which crosses the pulley *f*, passes along the lath, and descends over the pulley *g*, to the knot *k*. *h* is the third line of the hood, which passes over the pulley *i*, and meets the others at *d*; *k* is the knot where the two lines unite, which raise the entire blind: one line passes over the pulley *l*, and is attached by a hook to the slip *m*, which slides in a groove, and to which the rising bar of the hood, *n*, is hinged. The other line crosses the pulley *o*, proceeds along the lath, descends over the pulley *p*, and is attached to the other sliding slip at *q*. *r* is the thick cord, by pulling which the hood is raised; *s* represents the front iron. *t* is the line which the bar reaches when the hood is drawn up; and *u* is the thick cord, which must be grasped together with *r* to raise the whole blind. An elegant improvement on this description of blinds has been made by Mr. Vokins, in consequence of which they are much more easily drawn up, and are less likely to get out of repair.

SECT. II. *Of the Interior Finishing of Villas.*

2003. *The Interior Finishings of the Apartments of a Villa* embrace a variety of details, the principal of which may be included under those relating to architectural style, and those relating to decorations independent of style. To the latter belongs the consideration of the materials with which the walls, floors, and ceilings are covered, and of the colouring with which the whole is finished.

2004. *The architectural Style of an Interior*, it is sufficiently obvious, should correspond with the external appearance of the building; and the degree of decoration should be great, in the former case, in proportion as it is in the latter. The display of style in an interior is in general made on the same parts as in the exterior; viz., on the doors and windows, also on the chimneys which correspond to the chimney-tops, and on the ceilings which may be considered as corresponding to the roofs. The ceilings of rooms, next to the walls, are the principal parts where the expression of architectural strength requires to be given; and this is admirably done, in the Grecian style, by horizontal beams and rectangular compartments; and, in the Gothic style, by beams supported by brackets, and other projections, in the manner of what are called groined ceilings.

2005. *Internal Decorations which are independent of Style* are comparatively few. They are chiefly the disposition of mirrors, or of chandeliers, or other fixed lights, and of fixed sculptures and statuary. Perhaps the time is not far distant, when the regulators for ventilation, and for the admission of heat, which are fixed in floors, walls, and ceilings, will be included under this class of finishings; but the improvements in warming and ventilating are not yet sufficiently disseminated for this purpose. Though certain interior decorations may be considered independent of style none whatever are independent of construction. "The spirit of decoration," Percier and Fontaine observe (or rather Quatremère de Quincy, who obviously wrote the introduction to their work observes), "separated from that of construction, and not operating in concert with it, will make light of absurdities and contradictions: it will not only pervert the essential forms of the edifice, but it will make them disappear. Looking-glasses ill placed, or tapestry awkwardly fastened, will produce voids where there ought to be none, and *vice versâ*. Construction is to buildings what the bones are to the human body: it ought to be embellished, without being entirely concealed. It is the construction which, according to the country, the climate, and the sort of edifice, gives the motive for the ornaments. Construction and decoration have thus an intimate connection; and, if this connection does not appear, the whole is vicious. The execution of the work, whatever may be its extent and its importance, will have no effect on the mind, if the construction has not dictated the embellishment; if the first form does not seem in accordance with its accessaries; and if, in short, it is perceived that two wills, without harmonising together, have operated in the execution of the work." In accordance with this principle, whether a chandelier hang from a Grecian or a Gothic ceiling, it ought to be, or to appear to be, suspended from a beam, or other part of the construction, obviously sufficient for its support. To suspend any light of this kind from a plastered ceiling, perhaps painted in imitation of the sky, without any intervening decoration or preparation, but the hook to which the chain is attached, every one must feel to be inconsistent with the principles here laid down.

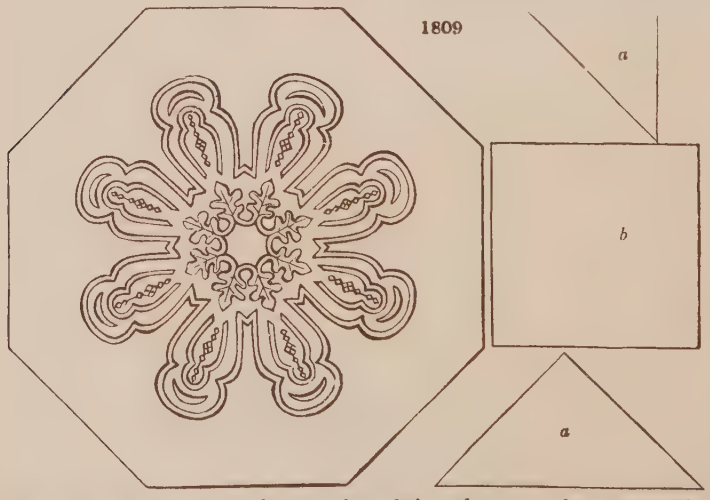
2006. *The Materials with which the Walls and Ceilings of Rooms are covered* have varied in different ages, and with different styles of Architecture. In ancient times, tapestry was the principal article employed, and this is still an appropriate covering for the walls of rooms in the Gothic style, and even in the most ancient Italian manner of building. To tapestry succeeded wainscoting, and to the latter the use of lime and hair plaster and stucco, and of printed papers pasted to these, or to canvass. The most durable mode, and that least susceptible of injury from fire, is the covering of plaster or stucco; even if this should require, from the style of Architecture, to be finished so as to resemble wainscoting.

2007. *Scagliola* is a mode of finishing with stucco which deserves adoption, more particularly in houses in the Grecian or Italian manner. The object is an imitation of marble, and the success is most complete. The art of making scagliola has been long well known and extensively practised in Italy; and also by Italian artists in most of the capital cities on the Continent; but it was not introduced into Britain till about the end of the last century. "In order to execute columns and their antæ, or pilasters, in scagliola, the following remarks and directions are to be observed: when the Architect has finished the drawing, exhibiting the diameter of the shafts, a wooden cradle is made, about two inches and a half less in diameter than that of the projected column. This cradle is lathed all round, as if for common plastering, and is afterwards covered by a pricking-up coat of lime and hair: when this is quite dry, the workers in scagliola commence their peculiar labours. The scagliola is capable of imitating the most scarce and precious marbles; the imitation taking as high a polish, and feeling to the touch as

cold and solid, as the most compact and dense marble. For the composition of it the purest gypsum must be broken in small pieces, and then calcined till the largest fragments have lost their brilliancy. The calcined powder is then passed through a very fine sieve, and mixed up in a solution of Flanders glue, isinglass, &c., with the colours required in the marble about to be imitated. When the work is to be of various colours, each colour is prepared separately, and they are afterwards mingled and combined, nearly in the same manner as a painter mixes, on his pallet, the primitive colours which are to compose his different shades. When the powdered gypsum, or plaster, is prepared, and mingled for the work, it is laid on the shaft of the column, &c., covering over the pricked-up coat, which had been previously laid on it, and is floated with moulds of wood to the sizes required. During the floating, the artist uses the colours necessary for the marble which he intends to imitate, and which thus become mingled and incorporated in it. In order to give his work the requisite polish or glossy lustre, he rubs it with a pumice-stone, and cleanses it with a wet sponge. He next proceeds to polish it with tripoli and charcoal, and fine soft linen; and, after going over it with a piece of felt, dipped in a mixture of oil and tripoli, finishes the operation by the application of pure oil. This is considered as one of the finest imitations in the world; the scagliola being as strong and durable as real marble, for all works not exposed to the effects of the atmosphere; it also retains its lustre as long, and equal to real marble, without being one eighth of the expense of the cheapest marble imported." (*Nicholson's Practical Builder*, p. 382.) The principal scagliola worker in London is Mr. Brown, whose rich and elegant museum, in University Street, contains the most beautiful specimens of vases, columns serving as candelabras, stands for busts, and a great variety of other objects. The chief use, however, of scagliola is for columns in rooms of a very superior description. Mr. Brown informs us that the art is brought to a much higher degree of perfection in London than it ever has been on the Continent; the reason being, that there it is considered as an inferior style of finishing next to marble, whereas here it is made to serve instead of marble itself, and, therefore, more pains are bestowed upon it.

2008. *The permanent Covering of the Floors of Rooms* is, for the most part, of boards; though scagliola, and various imitations of marble and stone, are common on the Continent, and especially in the villas of Italy, see § 1916. Mosaic pavement is also frequently used. An improved description of pavement of this kind, invented by Mr. Wright of Shelton, has already been mentioned. Figs. 1810 and 1811 show two squares, or quarries as they are technically termed, in which the ground, or plain space, is of one colour, and the ornament inlaid is of a different colour. Fig. 1809 is an octagon quarry

1809



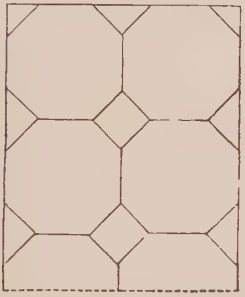
for halls, with angle pieces, *a*, and centre pieces, *b*, in order to complete a square figure, as in fig. 1812, whatever may be the dimensions of the floor to be covered. The angle and centre pieces are supposed to be of a different and darker colour than the ground, or plain part, of the figured tiles. The manner in which the inlaying of the ornament is effected is very simple, and is described at length in the *Repertory of Arts*. A depression is made on the surface of the tile, in the form of the intended ornament, and the cavity thus formed is filled in with coloured clay; the tile is afterwards burned in the kiln, so that the ornament may form one mass with the rest. Mr. Wright informs us that

1810

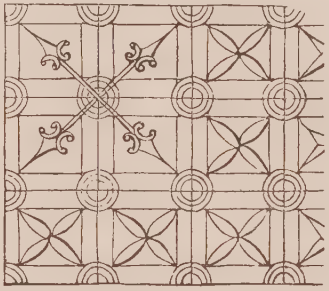
1811

nothing can exceed the strength and durability of these tiles, and from their appearance we do not doubt it: they are also very smooth, and highly ornamental. Another description of flooring tiles for halls, Mr. Peake of Tunstall informs us he has seen at Lillie's Hall, in Shropshire, of which fig. 1813 will give a general idea. Various descriptions of

1812



1813

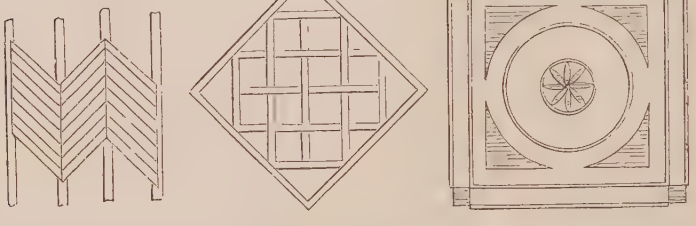


plaster floors are in use for villas, which may either be painted in imitation of marble, or kept covered by carpeting. In some cases the preferable mode is to paint the margin of the floor round the room in imitation of marble or other stone, or of oak, or of some other dark wood; or to finish this margin with scagliola, and cover the interior with carpeting. A very successful imitation of Portland stone, which does not cost half the price of that material, has lately been made by Mr. Bagshaw. Were it not for the cold impression made on the feet by stone, slate, tile, or plaster floors, their introduction in all houses whatever would be very desirable, as lessening the risk of danger from fire.

2009. *Boards* have long been, and probably long will be, the principal covering for the floors of villas in Britain. Three improvements have been made in them. To prevent warping, and to lessen the risk of their being burned through by fire, they are sometimes laid down in large houses three inches thick. For the first of these objects, and also to get rid of inequalities, and save the expense and disagreeable labour of continually washing with soap and water, our correspondent, Mr. Robison, proposes, "when the floors are newly laid and in good order, to cover them over with a copious soaking of boiled and hot linseed oil, and afterwards to paint them with two coats of good oil colour. Very little warping will probably take place after this, and a slight sponging with cold water will at all times be sufficient to render them perfectly clean and clean-looking." The third great improvement is the use of the planing machine, invented by Mr. Milne, Engineer, Hutchesontown, Glasgow, by which a board of the ordinary width, and twenty feet long, can be reduced to an equal thickness, planed perfectly smooth on one side, and grooved on one edge and tongued on the other, in one minute. This greatly lessens the labour of laying the boards down as floors, and insures the advantage of an even surface.

2010. *Parquetted, or Inlaid, Floors* took their origin from the circumstance of long thin boards being liable to warp. The first and simplest kind of inlaid floor is formed by using boards of three or four feet in length, and three or four inches in width, and disposing of them as in fig. 1814. A second mode employs veneers three feet in length, and from a quarter to half an inch in thickness, interlacing them so as to form a square or panel, in the manner represented in fig. 1815; the smaller squares or quarries being filled in with the same, or with a different kind of wood. A more refined description of inlaying, which the French call marquetterie, consists in the employment of different colours, which are laid down in such a manner as to imitate mosaic work. The practice

1814 1815 1816



was first introduced in Florence, and it has subsequently been employed in most of the great palaces of Europe. It has lately become fashionable in Britain, partly in consequence of the recent inventions that have been made of machinery for sawing up and planing wood, in which great improvements have been made since the first planing machine was invented by General Bentham, about the beginning of the present century. At the exhibition of the National Repository in 1829, a very handsome specimen of inlaid flooring, fig. 1816 (from the *Mech. Mag.*), was exhibited by Mr. James White. Each of the compartments, in this specimen, is formed of a different kind of wood, and the colours are arranged so as to harmonise. Inlaid floors, when composed of different colours, should never be entrusted to the sole management of a common joiner; and Architects need not consider them beneath their attention.

2011. *Colour*, next to the size and general proportions of a room, exercises the most important influence on the eye of a spectator. Colour may be either communicated to the walls by printed papers, by hangings of plain cloth or tapestry, or by painting. To the ceiling it is, for the most part, only communicated in the latter manner; and to floors, in Britain at least, the carpet affords the principal medium of colouring. "A handsome room may be quite spoiled by bad finishing, and by ill-chosen colours of the walls and furniture; and the defects of a poor one concealed, or at least much diminished, by good management in this respect." (*Wood*, vol. i. p. 451.)

2012. *With respect to Hangings of Plain Cloth and Printed Paper*, very little can be laid down in the shape of rules that will not be included under the general principles, and the rules drawn from them, taught by the art of painting or colouring apartments generally. It must be confessed that this department of the art of interior decoration has not been hitherto reduced to any regular theory, and that the subject appears to be only understood by artists of a superior description, whose employment is necessarily very limited. After consulting all the works that are considered the most valuable on the subject of house and ornamental painting, we think that by far the best, and indeed the only one that embraces principles, is a small work entitled the *Laws of Harmonious Colouring, &c.*, by Mr. D. Hay, House Painter, Edinburgh. For the mechanical part there is a very complete work, in a thick quarto volume, by Mr. N. Whittock, called the *Decorative Painter's and Glazier's Guide;* which also embraces the subjects of imitating a great variety of woods and marbles, and of staining glass. From the former work we have drawn the following paragraphs; but to understand the theory of house-painting so as to be able to act on it, the reader must consult Burnet, Syme, Lairesse, Hassel, Reade, Schimmelpennick, &c., including an able article on painting in *Brewster's Encyclopædia*. For varnishing, the most useful work is by Tingry.

2013. *Harmony of Colours* is produced by the juxtaposition of two colours, such as red or yellow, with an intermediate colour, such as orange, to unite them. "Harmony consists more in the media which unite the several colours, than in the colours themselves; and therefore, in completing the arrangement of colours for an apartment, a neutralising colour, possessing the properties of both contrast and harmony, should be introduced, in order to give keeping and repose to the whole. The colouring of rooms should be an echo to their uses. The colour of a library ought to be comparatively severe; that of a dining-room grave; and that of a drawingroom gay. Light colours are most suitable for bed-rooms. The colouring of all rooms depends so much for its effect on the colour of the furniture, that this ought always to be known to the decorator, before he determines his system of composition."

2014. *Defects in the Colouring of Rooms.* "The first and most obvious defect in the colouring of rooms is, when there is no particular tone fixed on for an apartment; that is, when one part of the furniture is chosen without any reference to the rest, and the painting done without any reference to the furniture. This generally produces an incongruous mixture; and is, in comparison to a tastefully decorated apartment, as far as

regards colouring, what a child produces with its first box of paints, to the work of a great master. A second and more common fault is, the predominance of some bright and intense colour, either upon the walls or floor. It is evident that the predominance of a bright and overpowering colour upon so large a space as the floor or wall of a room must injure the effect of the finest furniture. This great error often arises from the difficulty of choosing a paper hanging or carpet, and our liability to be bewildered amongst the multitude of patterns which are produced; the most attractive of which, on a small scale, are often, from this very circumstance, the more objectionable in regard to their forming a large mass in an apartment; particularly as the artists who design them seem to be regulated by no fixed principles; but, from their repeated deviations from the established rules of harmony, appear to give themselves up to the vague pursuit of novelty alone. A third error is, introducing deep and pale colours, which may have been well enough chosen in regard to their tints, but whose particular degrees of strength have not been attended to. Thus, the intensity of one or more, may so affect those which they were intended to balance and relieve, as to give them a faded and unfinished appearance. This may proceed from applying the fundamental laws without any regard to the minutiæ; for although it is always necessary to subdue and neutralise such colours as are introduced in large quantities, yet, when they are reduced by dilution alone, the effect is very different. There is a fourth defect, and rather a common one, and that is a want of the media which unite and harmonise an assemblage of bright colours which may, in other respects, be perfectly well arranged; for it is a rule in the higher branches of the art, that confusion of parts of equal strength should always be avoided. A room of this description resembles a Chinese landscape, where foreground and distance are jumbled together. An opposite effect to this is monotony, or a total want of variety; for some are so afraid of committing errors in point of harmony, that neutral tints alone are introduced, and sometimes one tint of this kind alone prevails. Variety is a quality found to exist in the most trifling as well as in the grandest combinations of Nature's colouring; and it is, as already observed, in uniting and making an arrangement of various colours, harmonious and agreeable to the eye, that the skill of the house-painter chiefly consists. It is this which produces what is termed repose in a picture, a quality equally desirable in the colouring of an apartment."

2015. *Requisites for good Colouring.* "All colours brought together, to form an agreeable whole, should be considered not only in regard to tint, but tone, depth, quantity, and situation. The tone is the first point to be fixed, and its degree of warmth or coldness will be regulated by the use, situation, and light of the apartment. The next point is the style of colouring, whether gay, sombre, or otherwise. Unison, or a proper combination of parts, is the next consideration."

2016. *The Tone of Colouring* "is generally fixed by the choice of the furniture; for as the furniture of a room may be considered, in regard to colouring, in the same light as the principal figures in a picture, the general tone must depend upon the colours of which it is composed: for instance, if the prevailing colour of the furniture be blue, grey, cool green, or lilac, the general tone must be cool; but if, on the other hand, it is red, orange, brown, yellow, or a warm tint of green or purple, the tone must be warm. But, as hinted before, there can be no pleasing combination of colours without variety; this, by judicious management, may be given without in the least interfering with the tone, for it is merely the general colour of the furniture which ought to fix the tone, and there may be the most decided contrasts in its parts, which, by the introduction of proper tints upon the other parts of the room, can be reconciled and united. Apartments lighted from the south and west, particularly in a summer residence, should be of a cool tone; but the apartments of a town house ought all to approach towards a warm tone; as also should be such apartments as are lighted from the north and east of a country residence. When the tone of an apartment is therefore fixed by the choice of the furniture, it is the business of the house-painter to introduce such tints from the ceiling, walls, &c., as will unite the whole in perfect harmony; and this, it may be observed, is a difficult task. The colours of the furniture may be arranged by a general knowledge of the laws of harmony; but the painter's part can only be done by the closest attention to all the minutiæ of the art."

2017. *The Style of Colouring* "is the next point to be fixed, and will depend entirely on the use of the apartment. In a drawingroom, vivacity, gaiety, light, and cheerfulness should characterise the colouring. This is produced by the introduction of light shades of brilliant colours, with a considerable degree of contrast, gilding, &c.; but the brightest colours and strongest contrasts should be upon the furniture, the effect of which will derive additional value and brilliancy from the walls being kept in due subjection, although, to a certain extent, they also should partake of the general lightness."

2018. *The characteristic Colouring of a Dining-room* "should be warm, rich, and substantial; and, where contrasts are introduced, they should not be vivid. This

style of colouring will be found to correspond best with the massive description of the furniture: gilding, unless in very small quantities, for the sake of relief, should be avoided."

2019. *Parlours* "ought to be painted in a medium style between that of a drawing-room and that of a dining-room."

2020. *For Libraries*, "the most appropriate style of colouring is solemn and grave, and no richer colouring should be employed than is necessary to give the effect of grandeur, which can scarcely be done where one monotonous tint prevails; but care should be taken not to disturb the quiet and solemn tone which ought to characterise the colouring of all apartments of this description."

2021. *In Bed-rooms* a light and cheerful style of colouring is the most appropriate. A greater degree of contrast may here be admitted between the room and its furniture, than in any other apartment; as the bed-curtains, &c., form a sufficient mass to balance a tint of equal intensity upon the walls. There may also, for the same reason, be admitted gayer and brighter colours upon the carpet.

2022. *Staircases, Lobbies, Vestibules, &c.*, "should all be of rather a cool tone; and the style of colour should be simple and free from contrast. The effect to be produced is that of architectural grandeur, which owes its beauty more to light and shade, than to any arrangement of colours. Yet they ought not to be so entirely free from colour as the exterior of a mansion, but should be in colouring, what they are in use, a link between exterior simplicity and interior richness. Staircases and lobbies, being cool in tone, and simple in the style of their colouring, will much improve the effect of the apartments which enter from them." (*Hay's Harmonious Colouring*, p. 28.) We strongly recommend Mr. Hay's work to every painter who aims at excellence in his profession, and to every amateur who wishes to judge for himself. To those who are at such a distance from Mr. Hay as not to be able to employ him, we would suggest the idea of sending him descriptions of their rooms, with the kind of furniture, hangings, and carpets which they are intended to contain, the mode of lighting, proportionate surface of pictures, &c., and to procure from him directions for proceeding, together with specimens of the different tints which he would recommend to be employed. Next to this we would recommend applying to an eminent scene-painter. This is the practice in Paris. In London, the house-painter of the greatest taste that we know is Mr. Fair, of Mortimer Street, whom we can strongly recommend.

2023. *The Arabesque* is a description of fanciful ornament, comprising a great variety of objects, brought together apparently without order or reason. Though it chiefly belongs to the Italian style, yet it is applicable to any manner of finishing; because the objects, brought together, may always be chiefly taken from the style of Architecture employed, and from natural objects. At first sight of an arabesque, the mind of a person unaccustomed to see this description of ornament, is apt to ask, what can be the meaning of such a composition? The answer, according to Quatremère de Quincy, is to be found in the natural love of mankind for the marvellous. Man is not able to create any particular object, but he can create combinations of objects already existing. He can bring together objects which are never found together in nature; he can compose plants and animals different from any plants or animals now existing, by joining the parts of one animal or plant to the parts of another; or by joining parts of animals to parts of plants. In short, the composition of arabesques is a capricious exercise of the imagination, by an artist whose mind is richly stored with ideas, and whose hand has great facility with his pencil. Nevertheless, in all this, the same author observes, there must reign a certain comparative regard to truth, and to the production of a harmonious whole. For example, the most delicate foliage must not be represented as supporting an object of great weight; solid bodies must not be shown as hanging in the air; in every thing, possibility must be kept in view, and the whole must express a unity of purpose, and a harmony of lines, forms, and colours. No one ought to attempt the arabesque, whose mind is not fertile in resources, and whose pencil is not apt in delineating every description of object. The term arabesque, the author quoted has shown, is erroneously applied to ornaments of this description; for, so far from their having been invented by the Arabs, they were found on the walls of the ruins of Herculaneum and Pompeii; and, indeed, the Arabs are forbidden by their religion to imitate the figures of men or animals. In short, this mode of varying the forms of natural objects is seen more or less in all architectural sculptures; and, indeed, in all imitations of nature, not intended to be fac similes, or scientific representations, of animals or plants.

2024. *Egyptian Ornaments.* Mr. Hope recommends young artists "never to adopt, except from motives more weighty than a mere aim at novelty, the Egyptian style of ornament. The hieroglyphic figures, so universally employed by the Egyptians, can afford us little pleasure on account of their meaning, since this is seldom intelligible: they can afford us still less gratification on account of their outline, since this is never agree-

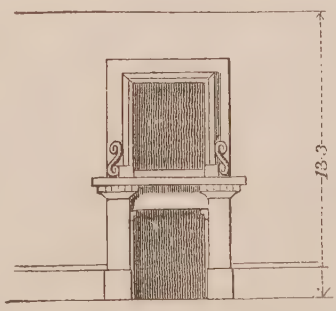
able; at least in as far as regards those smaller details which alone are susceptible of being introduced in our confined spaces. Real Egyptian monuments, built of the hardest materials, cut out in the most prodigious blocks; even where they please not the eye, through the elegance of their shapes, still amaze the intellect, through the immensity of their size, and the indestructibility of their nature. Modern imitations of those wonders of antiquity, composed of lath and plaster, of calico, and of paper, offer no one attribute of solidity or grandeur to compensate for their want of elegance and grace, and can only excite ridicule and contempt."

2025. *Gilding*, as forming a part of decoration, is a subject on which there is some diversity of opinion. All, however, are agreed, that its effect in interior finishing is rich and magnificent beyond that of any other material. The richness seems to arise, in a great measure, from the actual value of the gold, or the associations of value connected with it; because, in Architecture, as in all other arts, where two objects are equally beautiful in regard to forms and lines, that will be most esteemed of which the material is of the greatest intrinsic value. The magnificence appears to result from the brilliancy of the colouring. Merely as a colour, therefore, gilding appears desirable where the furniture of a room consists of rich-coloured woods. Where there are a number of different-coloured marbles, and white cornices, with crimson or orange curtains, gilding is a great addition. "Gilding, or a small portion of bright yellow," that excellent practical artist Hay observes, "will be found to heighten the effect of a room, wherever scarlet is the prevailing colour." (p. 53.) Hence we find that artists generally prefer a crimson or scarlet ground for the wall on which their gilt-framed pictures are hung.

2026. *Plating or Silvering* may sometimes be used in decorating rooms; but the practice is by no means general. A correspondent informs us that a gentleman residing in the neighbourhood of Edinburgh made the experiment on an extensive scale, at considerable expense. He furnished a drawingroom with pale green, as the prevailing tint, the hangings and furniture were silk damask, and the walls were covered with plain flock paper. The mouldings and picture-frames were silvered, and likewise the door handles, and some other matters. The effect was not satisfactory to most observers, who said that the room had a raw look by daylight; and that, by artificial light, the picture-frames, &c., appeared as though they were formed of tin or pewter, not well scoured.

2027. *As an Example of the Finishing of a Room* in a new style, we shall quote, from a letter of Mr. Robison, an account of his own drawingroom, "I have lately ventured to try an experiment in the finishing of my principal drawingroom, and I send you the particulars, because they coincide in a curious manner with much of what your correspondent Selim recommends, in his description of the interior of Beau Idéal Villa. In the first place, there are only three colours throughout the whole; viz., white (or rather new-milk colour), pure crimson, and green. The ceiling, cornices, woodwork, and canopies of the window hangings are white, enriched with gilding; the hangings (silk damask), the ground of the walls, and that of the carpet, crimson; and the pattern on the carpet a sort of tracery of creeping plants in shades of green. The chimney-piece is of white marble, reaching nearly to the ceiling, with a panel, equal in width to the opening of the chimney, filled with mirror, as in fig. 1817. The walls are 13 feet 3 inches high, and are painted in imitation of morocco leather, enriched with roses in gilding, shaded by hand; the whole varnished with copal. The woodwork (there is no dado or surbase) is flat white, with the convex mouldings gilded (in oil gold, and varnished). The painter's work was done by a most ingenious artist here, a Mr. D. R. Hay, who has written a very instructive work (before quoted) on the laws of harmonious colouring as applicable to house work. The imitation of morocco has been most successful; so much so as to deceive a bookbinder, who enquired where such enormous skins were to be obtained. The window hangings are of the simplest form; mere large curtains, without draperies or fringes. They hang in vertical lines, and catch no dust. They run on gilt wooden poles, 5 inches in diameter, *a* in fig. 1818, having two slips of brass beading (such as is used by coachmakers) laid along the top, so that the curtain rings, *b*, run on the poles without injuring the gilding; the curtains are hooked on at *c*, in the usual manner. This arrangement is better than having brass poles, and makes little noise. In the inside of the canopy or cornice (from which the large pole advances far enough to allow room

1817



for the rings to pass free) is a common French curtain-rod, on which runs a very fine but plain muslin sun-curtain, edged with crimson cherry fringe. The cords for drawing the curtains, instead of being concealed, are made very conspicuous, and contribute much to the general effect. They are about the thickness of half an inch, of plaited worsted cord, with handsome terminations. They run on sheaves of 6 inches in diameter, let into the knobs at the extremities of the poles, and are long enough to admit the ends to be reached by the hand in the extreme positions of the curtains, when, of course, one is shortened and the other lengthened to the extent of the width which the curtain has traversed. The long end is then looped upon the bracket which confines the curtain. The idea of this arrangement was suggested to me by an old picture. The whole of the crimson in the room is, as near as practicable with the different materials, of the same hue; the lake for the walls having been first procured, and the silk and worsted dyed to match it. From this circumstance, and from its being contrasted by the green, and relieved by the white and gold, it has no more of a predominant hue in the arrangement than is perfectly agreeable; while it gives great distinctness to the pictures, and a general air of warmth and comfort, without appearing glaring or gaudy. In the design and construction of every thing in the room, the aim has been, to avoid harbourage for dust, and to reduce to a minimum the time required for keeping it in order. If this principle were kept in view by cabinetmakers and upholsterers, we should be spared the sight of such a variety of meaningless draperies and dirty finery as are constantly exhibited; and which, although often of flimsy and common materials, are made to cost more than properly made furniture, of materials of the best and most lasting description. The room your correspondent, Selim, mentions at Earlstoke must have been delightful. Titian could not have produced more harmonious colouring; the drawingroom proposed with bright blue hangings would be difficult to carry through; as the tints which would be required to make a regular optical harmony by daylight would show quite different by artificial light, which has so little of the yellow part of the spectrum in it, that even orange (the contrasting colour to the blue of the spectrum,) would appear a dirty white by candlelight, while the blue would retain all its clearness. I suspect it is from feeling this, that, in arrangements where delicate blue is introduced as a principal colour, the contrast is generally sought in pure white and gold."

1818

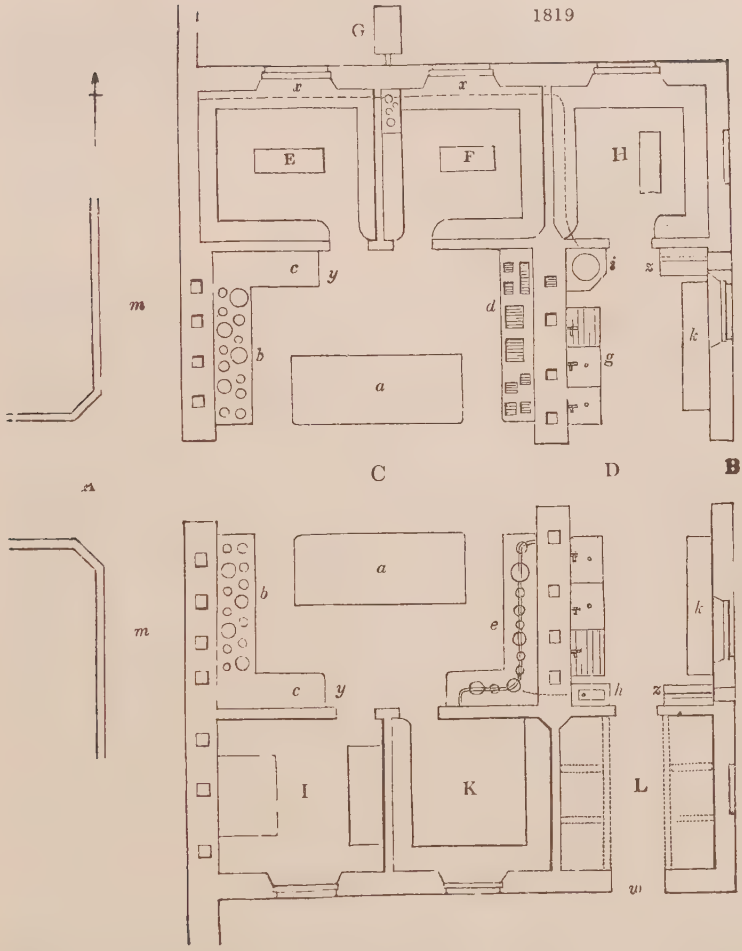
Sect. III. *Of the Fixtures and Fittings-up of Villas.*

2028. *The Fixtures and Fittings-up* of villas include many articles already described when treating of the fittings-up, &c., of cottages, farm houses, and inns; nevertheless, there are a few articles remaining to be noticed, which we shall include in two subsections.

Subsect. 1. *Of the Fixtures and Fittings-up of Villa Offices.*

2029. *The Kitchen.* In the neighbourhood of Leamington, in Warwickshire, we are informed, open fireplaces are entirely laid aside in the kitchens of a number of villas. Instead of them, a fire is made in a furnace in the middle of a raised hearth or brick bench: it is covered with a cast-iron plate, having an opening of about nine inches in diameter, into which a lid is fitted. This lid is taken off when broiling is to be performed, but at all other times it is kept on. Two flues pass from the furnace, one to the right and the other to the left, and there is a damper to each flue, so that at any time the whole of the heat can be turned into any one of the flues. There is also a third flue, which communicates directly with the upright chimney, into which the whole of the smoke and heat can be at any time thrown. To the right of the central fireplace, and next to the fire, there is an oven, properly arranged for roasting meat; beyond it, there is another arranged for baking; and farther on, a third, serving as a closet for keeping articles hot. The fire, after having passed round these ovens, returns to the central chimney in a flue with a cast-iron cover; on which cover stewing may be carried on in different saucepans. The flue which passes out of the furnace to the left has a cast-iron cover, which can be rendered sufficiently hot to boil articles, and here both boiling and stewing can be performed. In returning, this flue passes round a boiler, which contains a perpetual reservoir of hot water, and round a second oven for roasting meat. We have been informed by a gentleman who has paid great attention to subjects of this kind, that, in kitchens thus fitted up, there is a great saving of fuel and labour; and that the heat of the apartment is much less than in kitchens having open fireplaces.

2030. *A Kitchen and its Appendages, as designed by Mr. Mallet.* In fig. 1819, A is the entrance to the kitchen from the dining-room, and from the two corridors, *m m*, running parallel to it, and communicating with the housekeeper's, steward's, and butler's rooms, and other servants' offices; B, the entrance to the scullery from the kitchen court; C, the kitchen, twenty-five feet by thirty feet; D, the scullery, thirty feet by sixteen feet;



E, the larder, sixteen feet by sixteen feet; F, the pantry, of the same size; G, refrigeratory, under an open shed; H, apparatus-room, sixteen feet by sixteen feet; I, pastry-room; K, store-room; and L, fuel-room, each sixteen feet by sixteen feet. The fuel-room is divided into six bins for charcoal, coal coke, wood for lighting fires, common coal, coal cinders, and coke cinders, or coke breize as the cinders of coke are usually called. "The details of this plan are as follow: — In the kitchen, C, *a a* are large kitchen tables, which are fixtures with cast-iron legs and oak tops; each table has a row of large strong drawers beneath, nine feet long by three feet three inches wide; *b b* are two long ranges of what are commonly called 'stew-holes,' or apertures of various sizes in a cast-iron hot plate, for the admission and application of various culinary vessels, all heated by one close fire or small furnace at the end next the kitchen door. Beneath the flue which heats the top plate and stew-holes may be placed a range of hot-closets for heating plates or other things, or performing operations requiring a low heat; *c c* are two plates, or hearths, on which any large or wide vessels may be placed to boil, &c.; beneath each is a cubical oven, round which the flame of the fire or furnace, which is placed at the ends, *y y*, is caused to play, and in these ovens such is the heat, that meat may be roasted, or baked, by proper regulation of the fire. Dampers should be provided to all flues in kitchens, in order that a perfect command of heat may be obtained. Both *b b* and *c c* may be about two feet six inches wide; the wall against which they are built should have a proper cast-iron skirting, one foot above their top level; *d* is a range of charcoal hearths or grates, such as are in common use on the Continent. Each is simply a frustum of

an inverted quadrangular pyramid, terminated at the less end by an open grate, and dropped into a square hole formed in a cast-iron or earthenware table to receive it, as in fig. 1820. They are especially used in Italy, and I have often watched the dispatch and neatness with which cookery may be performed by this simple apparatus. As a first-rate kitchen is but a kind of culinary laboratory, it is well to have such a universally available apparatus at hand; as it can be used with effect at five minutes' notice, while every other kind of apparatus, except that for cooking by gas, requires some time to be put into working trim. Charcoal, of course, is the fuel used; which, unfortunately, involves the necessity of having a hood over this apparatus: this hood may be made of wood, tin, copper, or iron, or it may be neatly and well made of earthenware tiles. A table apparatus fitted up with gas burners for cooking, in a manner hereafter to be more fully described, is shewn at *e*. The table itself is of cast iron, and underneath it are several wrought-iron cylinders, made steam-tight, with manhole covers properly secured for cooking, and particularly for making soup, by high pressure steam, generated by the boiler placed in the scullery immediately behind. Soup can be made, by these means, from almost any kind of bones (say those of fish, for instance), superior, I think, to any other."

1820

2031. *The Scullery*, D. In this room, *f* is a large cast-iron sink for washing fish, and vessels of different kinds; *g* is a similar sink, to be used solely for washing vegetables (see figs. 1259 and 1332). A flap-board may be added to *f*, for laying down plates and dishes, when washed, to drain. Each sink has a supply, by cocks, of hot and cold water; *h* is the high pressure steam-boiler before mentioned: it is of wrought iron, cylindrical, with hemispherical ends, two feet long, and ten inches in diameter, and the iron is nine sixteenths of an inch thick. It may be worked to eight atmospheres, and should have two safety valves, each one inch and a quarter in diameter: one of them should be locked up, in order to render it inaccessible to servants. The steam from this boiler may be used to warm the store-room occasionally; *i* is an open boiler for boiling and cleansing the cloths used in culinary operations, such as pudding-cloths, &c., which are not things that should be sent to the general laundry. It is also to be made, by the circulation of hot water, subservient to heating the apparatus-room, pantry, and larder, through the line of pipes shown by the dotted line, *x*. This open boiler will also afford a supply of hot water to both the sinks, *f* and *g*. The cleaning of cloths may be done by night, so as not to interfere with the purity of the water by day. This boiler must be self-supplied. There are two tables, *k k*, of considerable magnitude, on which culinary materials, when first introduced from the kitchen court, may be laid. Large plate drainers may be placed in the corners, *z z*.

2032. *The Fuel-Room*, L, must have an external door, as shown at *w*, for the introduction of fuel: it should be divided into bins of brickwork for the various kinds of fuel.

2033. *Apparatus-Room*, H. This is a room in which bright copper vessels, and all the finer utensils of the culinary art, should be kept. No vessels are so safe, in a poisonous point of view, as glass; and, if cooks were only a little better educated, almost any operation at present performed in copper vessels might be done in glass, or porcelain, over gas flames, charcoal, or hot air. If this idea were reduced to practice, an apparatus room would be essential. It should contain a knife-cleaner, and a broad band of buff leather, coated with fine emery, to clean the vessels with rapidity: this should be worked by the foot. The room should be fitted up with shelves, racks, &c.; and should have a middling-sized table in the centre.

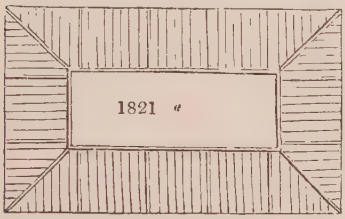
2034. *Pantry and Larder*, E and F. Both these rooms should be fitted up with shelves, and drawers in abundance; and a table, as large as convenient, should be placed n the centre, on which should be fixed a pair of scales with weights. The windows hould have fly wirecloth, and be capable of giving abundant ventilation.

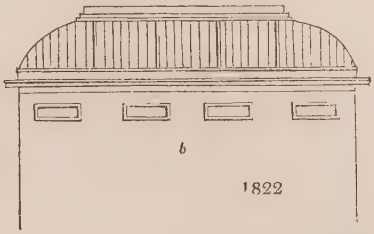
2035. *The Store-Room*, K, should be fitted up with shelves, drawers, hooks, &c.; and hould have a table with drawers and fixed scales of various sizes. A desk and books may be placed here, for the clerk of the kitchen, or head cook.

2036. *Pastry-Room*, I. This room is devoted solely to making and baking pastry. It has a large capacious oven of brick, cased in cast iron; and must have abundant ventilation. A table and scales must also be provided for this room, and various ovens may be suggested; but I think one on the plan of the common confectioner's oven as good as any.

2037. *General Construction.* The kitchen, scullery, fuel-room, and pastry-room should

be flagged with Yorkshire or Scotch flagstone, rubbed smooth, and given one coat of oil, to prevent grease from marking it. The store-room, larder, pantry, and apparatus-room should be boarded. The kitchen court should be flagged; and it should have a good fall from the kitchen to a drain with an air-trap. The kitchen itself should be lighted by skylights, as this mode throws the light best into open vessels. The roof may be constructed as shown in the vertical profile, fig. 1821, and in the elevation, fig. 1822. The top, *a*, is





a copper flat platform, surrounded by a continuous skylight of rolled sash-bar, like the roof of a hot-house, with principals strong enough to support the weight of the platform. There should be large opening ventilators below the cornice of the building, as shown at *b*; there should also be a large gas burner in the centre of the kitchen, with several over the hot hearths, &c., and in each other apartment one, except the scullery, which should have four at least. In building the kitchen, as many flues should be provided as possible, which may either join into one stack, or be carried up separately according to convenience; but none should be less than forty feet high, and they should not terminate under any large or very close building. In the scullery, both plate-drainers should be enclosed in front and at top with wooden casing, one end being placed against the outer wall, through which there should be a large aperture opening into the case, and covered with fly canvass; and the other end, that is, that opposite, should be likewise only covered with canvass. The casing should have doors in front, to take plates and dishes in and out: by these means, a current of fresh air will always be rushing in through the plate-drainers, which will, in a very short time, dry the plates perfectly. The chief ventilation to the scullery and kitchen should be through these plate-drainers. A large heavy block of wood should stand in the scullery, like an anvil block, for pestles and mortars to be used on; and, besides this, a heavy chopping-block, with a cover to keep the dust from it, for meat. Above each of the main cooking apparatus should be placed some small racks and shelves, in order that the cooks may have always at hand such utensils, as forks, ladles, spoons, plates, &c., as are necessary for immediately removing matters cooked.

2038. *The Walls of the Kitchen*, for seven feet high from the ground, should not be plastered, but built of rubbed sandstone, and left bare; because plastering is continually broken in such situations, looks ill when greased, and, if whitewashed frequently, is continually scaling off in small flakes, which fall into the cooking vessels, &c.

2039. *A large Table* should be appropriated solely to the purposes of dishing dinners on; and I would propose to make its surface of a sufficient number of two-feet wide flat wrought-iron tubes, heated by means of hot water circulating in them, from the waste heat of any of the neighbouring fires: an underground air tunnel should be provided, opening from the external air under this hot-water table, to be opened after the dinner is taken to the dining-room, in order that this great heated surface may not render the kitchen too hot.

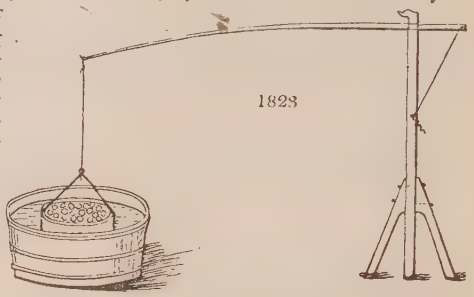
2040. *To prevent the Smell of the Kitchen from reaching the Dining-room* various plans have been proposed; but the only effectual mode is, either wholly or in part, to ventilate the kitchen by a current of air, from the direction of the dining-room passage, and towards the kitchen; and thus drive back the smell.

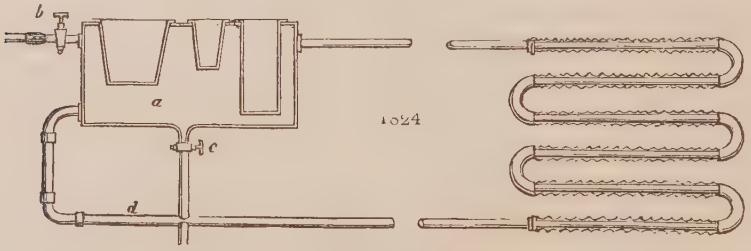
2041. *A covered Shed, Veranda, or Passage*, should be formed round the whole of the kitchen buildings, on three sides, to keep off the sun in summer, and to serve as a place for airing vessels, and for performing some of the coarser operations connected with the kitchen.

2042. *Among the Utensils of large Kitchens*, a potato-washer by rotation may occasionally be admitted; and a sieve hung from a flexible pole in a large tub, with a constant supply of water, for washing the softer vegetables, such as celery, &c., as in fig. 1823. This is, in fact, a ready mode of *sousing* them, and is the only way to get the aphides, &c., out of them; unless, indeed, salt and water or lime water should be used, as recommended in the first volume of the *Gardener's Magazine*.

2043. *Evaporatory Refrigerating Apparatus*, G. Most fluids of culinary use may be rapidly cooled by means of certain little vessels, sold by ironmongers, on the principle of

the refrigerators used by brewers; but others, as jelly, cream, ice, &c., can only be cooled by contact of cold fluids, or solids, in a state of rest. For performing this more effectually and rapidly, fig. 1824 is proposed as a kitchen fixture: *a* is a parallelopiped pan of bright planished (a planished surface is one first polished, and then pressed by a stamp with a smooth bright die) tin for holding water, filled by the cock, *b*, emptied by *c*, and arranged to hold ice pails, &c. &c., by immersion. From the upper part proceeds a horizontal pipe to a series of common one-foot flat wrought-iron pipes similar to those used for heating by hot water; the other extreme of which is connected with the bottom of the tin

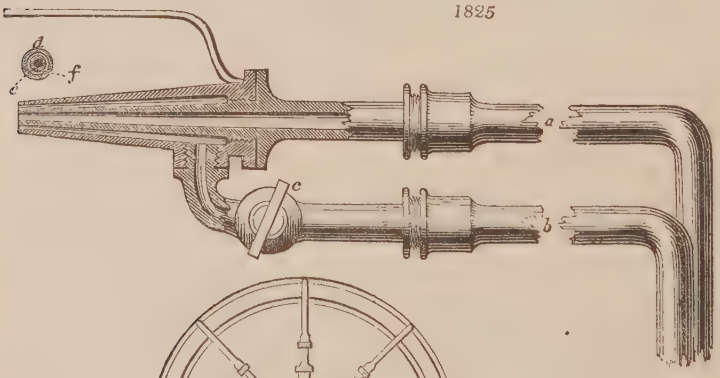

1823



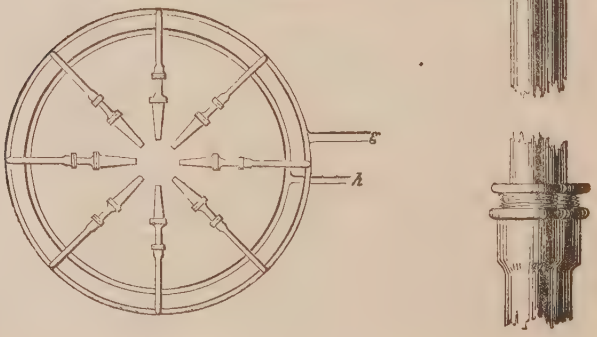
1824

vessel, by the pipe *d*. The flat pipes are covered loosely over with patent felt, kept moist by the dropping of a cock placed over it. The series of flat pipes is placed in a draught of air, or in an artificial draught caused by a tunnel, leading to the ash-pit of any furnace in the kitchen; and thus such an evaporation is kept up on their surface as cools the water in them; and, a circulation taking place, the fluids in the tin vessel are cooled likewise. Thus, blancmange, &c., may be readily cooled in the height of summer."

1825



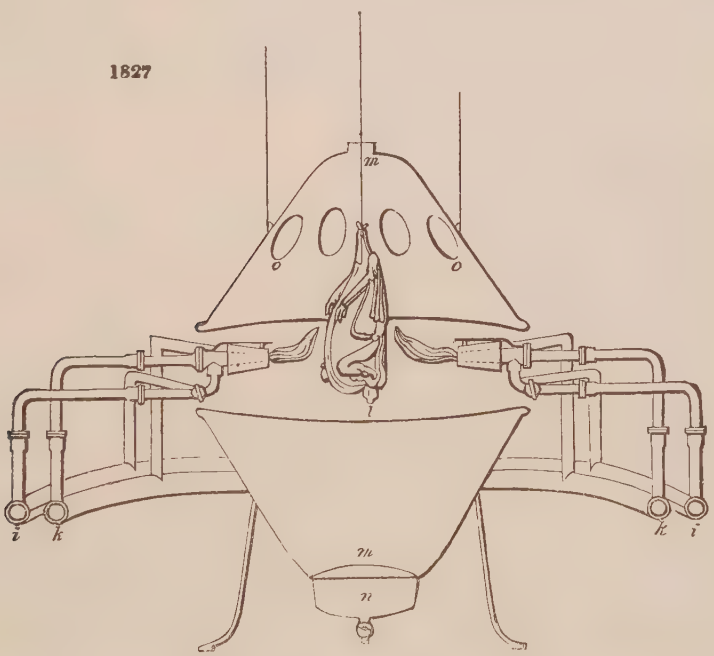
1826



2044. *Mallet's Apparatus for Cooking by Gas Flame.* "Annexed you have two or three figures (figs. 1825 to 1829) of my ideas for cooking by gas flame; a thing which has long floated in my head, but which I have said nothing of, lest the folks should suppose me 'daft,' as they say in your country. Some few years ago, I had occasion to make some weldings of iron where it was an important object that the metal should not be burnt away in the fire; and for this purpose I endeavoured to use a kind of huge gas blowpipe. I got one made of the kind shown in fig. 1825 as far as each jet is concerned, but of a much larger size. In this figure, *a* is the air tube; *b*, is the gas tube; *c*, the gas cock; and *d*, an end view of the point of the blowpipe, in which *e* is the circular orifice for the emission of air, and *f* that for the emission of gas. Mr. Daniell, of King's College, London, has since published the same thing as new, and of his invention; however, I can establish priority by my laboratory journal. To proceed: the jet, or blowpipe, is so made, that a current of atmospheric air is forced into the centre of the gas flame, by which means the latter is converted into a blowpipe of great power. Instead of a mere circle of gas-burners, I use a certain number of such blowpipe flames, arranged as radii of a circle, as in fig. 1826, in which *g* is the air pipe, and *h* the gas pipe; and each of the branches to the jets from these pipes has four small collars of leather or stuffing boxes, so that any one can be approached to, or withdrawn from, the centre of the circle, or raised or lowered, as occasion may require.

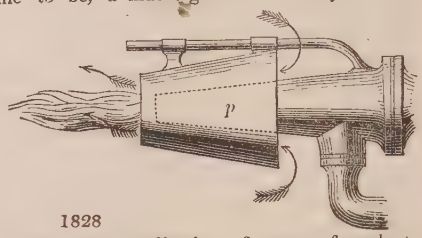
Fig. 1827 is a sectional view of such an apparatus complete, in action; a circular main tube, *i*, supplies the gas to all; and another, *k*, supplies the current of air, the means

1827



for producing which I will describe hereafter. The article to be roasted, *l*, is suspended from a bottle-jack, but with a swivel (such as those used by anglers) interposed; so that it may be permitted to turn, or be stopped, the jack still going on, as may be required. Above and below it are parabolic plated copper reflectors, *m m*; the lower one with a receptacle for dripping, *n*; and the upper one with six or eight small discs of plate glass, *o o*, inserted in proper places, to enable the operator to view the progress of coction. Each burner has a copper cone, *p*, placed so as to slide over it; by which means, besides the radiated heat convergent on the roasting matter, a current of hot air is continually urged against it, as shown more fully in fig. 1828. The upper reflector is hung by balance weights, so as to throw up in a moment; and, besides a cock to each individual gas tube of each burner, there is a general one to each of the air and gas main-tubes, so as to diminish the heat generally, or in any particular spot.

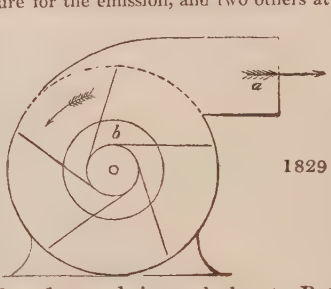
2045. *The Advantages of this Arrangement* over that of Mr. Hicks, which you have described, § 1515, appear to me to be, a much greater economy in fuel (as the waste heat from the upper reflector may be collected and conveyed away in a tube, and applied for the purposes of heating water, &c.); perfect combustion at a greatly increased temperature (viz., one sufficient to melt wrought iron), without any smoke; the means of a more perfect regulation, application, and adaptation of the heat to any given substance; a better form for the reflectors, and less escape of heated air by them; the application of copper funnels to the burners, by which a continuous current of hot air is urged against the article being roasted; and the capability of adapting the cordon of burners to an irregular mass, at equal distances every where.



1828

2046. *The Expense of this Apparatus* is far greater than that of Mr. Hicks; but fewer sets of apparatus will answer by this than by that mode; for the common circle will only suit things of nearly the same size, while my apparatus may be applied to any thing that can be admitted within it.

2047. *The Current of Air may be produced* by means of fanners, such as are occasionally used for producing a blast on a large scale, in iron founderies. These are to be worked either by a common jack, a smoke jack, or any other power at hand. The fanners are simply a few vanes of sheet iron, revolving with great rapidity (1500 times per minute) in a cylindrical case with a lateral aperture for the emission, and two others at the axis for the admission of air, as in fig. 1829. The vanes are set tangentially to the axis, and so revolve, that, by communicating a centrifugal force to the air in the cylinder, it is expelled at *a*, and fresh air drawn in at *b*, to be, in its turn, expelled likewise. Mr. Daniell proposed to heat the air in a red-hot tube for the purpose of this blowpipe, which would certainly be an improvement, and could readily be done by inserting a tube in the kitchen fire.



1829

2048. *Blowpipe Flames for boiling or stewing* may be made on the same principles; and those described, only placed vertically, will do: all that is necessary is, that several concentric alternate tubes of gas and air may be burnt. But I do not conceive cooking generally by gas, in the present state of the gas manufacture, and consequent high price of gas, economical; I, however, esteem it admirably applicable to cooking wildfowl, and similar exquisite *morceaux* of *gourmanderie*. When gas is publicly made from the decomposition of water, and I think the time is not far distant when that will be the case, it will be a cheap fuel for many purposes."

2049. *Remarks.* The foregoing very complete Design for a kitchen, and its appendages, and machinery, is on too expensive a scale to be generally adopted; but, once understood, it will be easy for the Architect to reduce all its parts to a minimum; or to reduce the essential parts, and omit altogether such as may be totally unnecessary for a villa on a very small scale. We do not offer an opinion on Mr. Mallet's plan for cooking by gas, as compared with that of Mr. Hicks; but the more we see and hear on the subject generally, the more we are convinced that the time is not far distant when cooking by gas will become common in all towns where lighting by gas is employed. Our correspondent, Mr. Robison, informs us that Messrs. Steele, brothers, ironmongers, in Edinburgh, are about to erect a kitchen for a gentleman in the neighbourhood of that city, on the plan given in p. 714 of this work, but substituting gas stoves for the coke fires, and adding a roasting and a baking oven, both heated by gas. A canopy is to be put up over the cooking hearth, like the sounding-board of a pulpit, and its apex is to be connected with a flue in the kitchen wall, by which means all the smells produced by cooking will be carried away as fast as generated. Mr. Milne, an eminent brassfounder in Edinburgh, who has had great experience in fitting up gas apparatus both in England and in Scotland, is of opinion that, in the city just mentioned, gas, in the better classes of houses, will soon take the place of coal fires, not only for cooking, but also for heating. We have lately seen not only roasting, but boiling and stewing, performed at Mr. Hicks's, and earthenware cones and radiating discs substituted for metallic ones, in a similar manner to that suggested by Mr. Mallet. For broiling, a disc is substituted for a cone.

2050. *The Brewery.* A very complete plan of a brewery, which was fitted up in Mr. Vokins's Grecian villa, fig. 1599, has been furnished to us by that gentleman. Fig. 1830 is the ground plan, in which A is the brew-house, having an oven, B, on one side, and two cellars, C C, for ale and beer, on the other. In the brew-house, A, *z* is a dotted line indicating the situation of a gallery, by which access may be had to the two boilers, *a a*; *b* is the situation of the mash-tub; *c*, that of a tub or cistern for receiving the wort, or decoction from the malt, previously to its being pumped up to the boilers; *d d*, &c., are coolers, or shallow troughs, on different levels, falling by steps from the boiler at *y* to the working tun at *x*; *e*, *x* are two working tuns.

1830

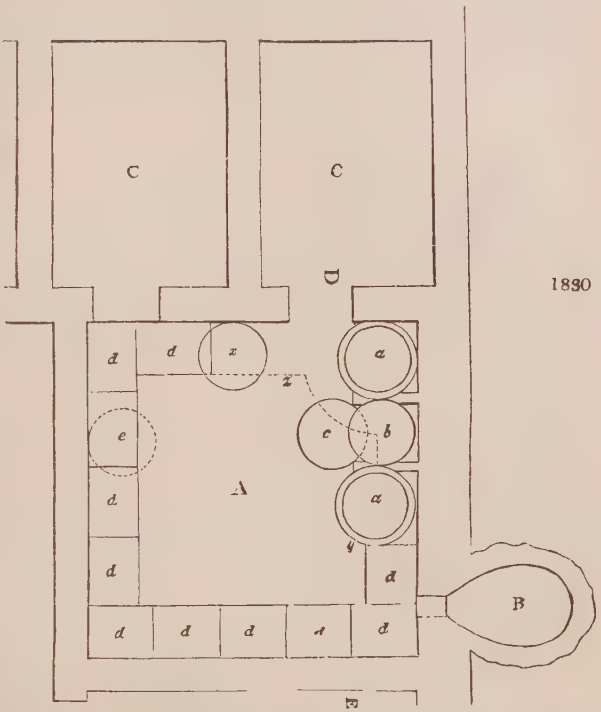
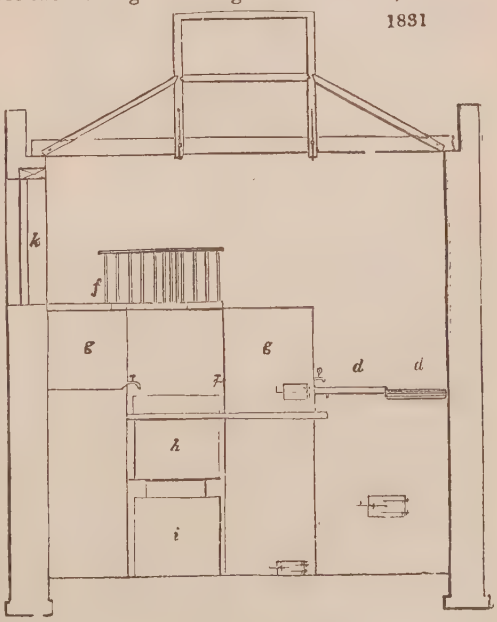


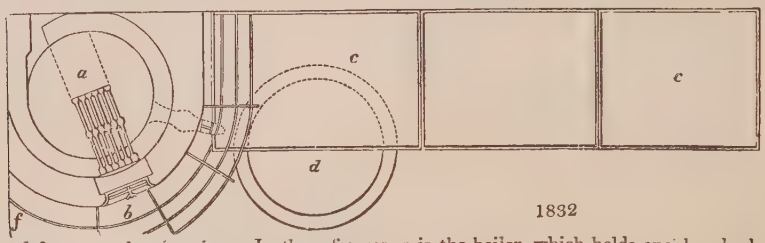
Fig. 1831 is a section, taken in the direction of D E; in which *f* is the gallery; *g g*, the two boilers; *h*, the mash-tub; and *i*, the under-back, or tub for receiving the wort when it runs off from the malt in the mash-tub. In the process of brewing, the malt is brought through the door, *k*, into the gallery, *f*, and dropped down into the mash-tub, *h*, into which boiling water is introduced by means of the two cocks shown in the boilers, *g g*. When the decoction is completed in *h*, the wort is let down through a hole in the bottom of that tub, to the tub, *i*, from which it is pumped up to the boilers, boiled in them, and then let off by cocks to the coolers, *d d*, from which it passes round nearly three sides of the building to the tuns, *e e*, where it is worked, and from these conveyed into the casks in the cellars by a leathern pipe. In this small building three hogsheads can be brewed at a time; the coolers being capable of holding that quantity when filled only

1831



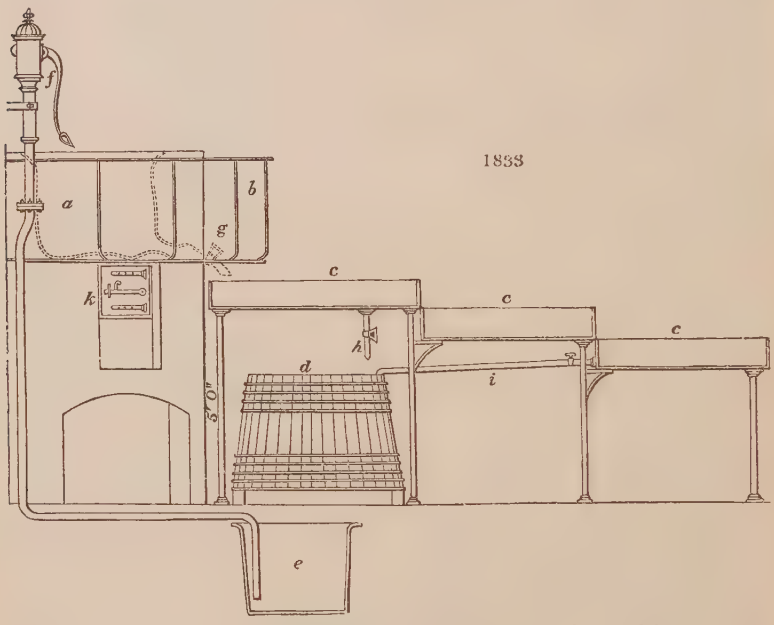
to the depth of two inches. The coolers are eleven in number, and fall from the boilers to the tuns, each the depth of itself.

2051. *A very complete Brewery, on a smaller Scale*, has been invented, and is now manufactured, by Messrs. Cottam and Hallen; of which fig. 1832 is the ground plan,



1832

and fig. 1833 the elevation. In these figures, *a* is the boiler, which holds one hundred gallons; *b*, the gallery for examining the boiler, and working the pump; *c*, the coolers,



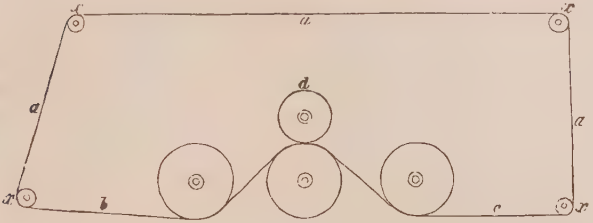
1833

seven inches and a half deep; *d*, the mash-tub; *e*, the cistern for receiving the wort from the mash-tub over it; *f*, the pump for drawing up the wort to be boiled; *g*, the cock by which the boiled wort is let into the coolers; *h*, a cock by which the hot water from the boiler is let down through the first cooler into the mash-tub upon the malt; and *i*, a cock and tube, by which the wort when cooled is returned to the mash-tub (after the grains have been removed from it), in order to be worked.

2052. *Remarks.* The first brewery is one of the most complete things of the kind any where to be met with on a similar scale; and the second, not less so, on a smaller scale. The coolers, in the plan of Messrs. Cottam and Hallen, are of sheet iron, and they are taken down and put up in very little time. The mash-tub, *d*, can also be removed, so as to be out of the way when the brewhouse is used as a wash-house; and there is a cover to *e* for the same purpose. To save trouble, on first filling the boiler with water, it may be poured into *e*, and pumped up.

2053. *Drying Closets*, Mr. Mallet proposes to form in a different manner either from that described by us, § 306, or that adopted in the Derbyshire Infirmary, and in a number of private laundries, as noticed in § 1466. He proposes to dry household linen "by its revolution over copper drums, heated by filling them with steam, as in the calico manufactories. The diagram, fig. 1834, shows at *a* the edge of a web of linen passing over and under the rollers. The linen to be dried is laid on it at *b*; it then

1834



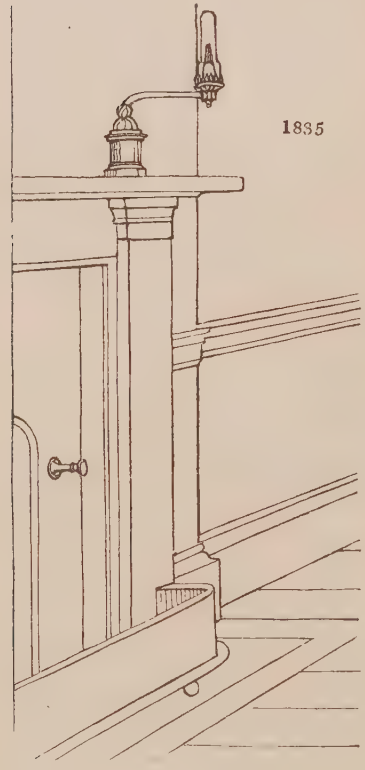
passes over and under the heated rollers, and is removed at *c*, having been dried in its course; *d* is a roller pressed hard against the middle copper one, which is made strong for the purpose. By these means the linen is mangled in its course of drying, so that both operations are performed together. The linen web is contrived with endless tapes, as in the patent printing machinery of Robson; so that the piece of linen to be mangled and dried may be carried over the rollers any number of times before it is removed, when it is once settled. The details are not complex; the steam goes into each roller at the axis, which is a stuffing-box. There may be frames placed under the rollers, to produce a current of air, and assist in the desiccation of the linen. The mangling roller may be thrown out of gear at pleasure. The rollers at *x* merely sustain the linen web. Two men's power would be sufficient to turn the whole machine, and one machine would dry thirty or forty shirts, five or six pairs of sheets, or other matters equivalent to that bulk at one operation. A boiler is indispensable in every laundry; and that, by having one of Perkins's linings, might be easily made to produce the steam both for drying the clothes, and for heating the water for washing them." In the laundry at Dunse Castle, near Dunse, Berwickshire, we saw in 1804, a mode of drying the family linen, which was somewhat similar to this, and was found to succeed perfectly. "In great houses," a correspondent observes, "unoccupied bed-rooms are sometimes damp. Mr. W. Strutt had a compartment in the drying-closet in his laundry, into which the whole bedding of one bed (included in an open-sparred wooden frame) could be put, like one of the clothes-horses. All the beds in his house were in turn aired in this way, one or two being done each day that the closet was heated for other purposes."

SUBJECT. 2. *Of the Fittings-up and Fixtures of the Dwelling-Rooms of Villas.*

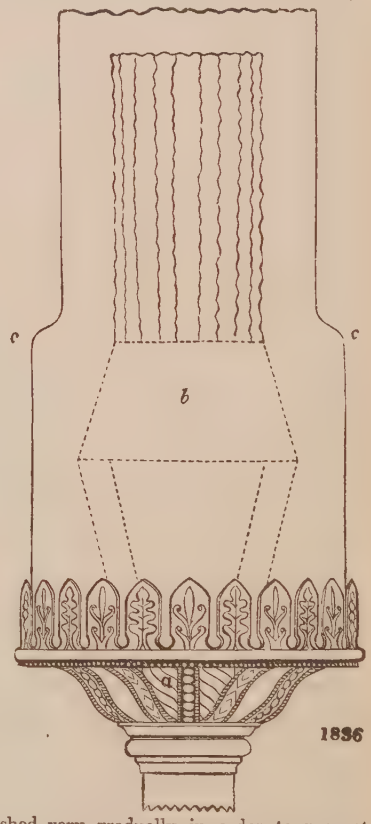
2054. *The Fittings-up and Fixtures* required for heating and lighting are those of most importance in villas, as in every other dwelling; but we have not much to add to what will be found in the sections on these subjects in our preceding books.

2055. *Lighting Rooms by Gas* has hitherto been chiefly employed in towns and suburban villas; but we have no doubt that, with the progress of improvement, it will be found worth while to adopt it in all country villas, except those of the smallest size: for example, in all those where more than thirty lights are required for the living-rooms and offices; and as it is by no means improbable that gas may be soon employed not only for lighting, but for cooking and heating, in that case it may become desirable for every villa to have a gasometer. The saving in labour would be great; but, what to us is still more gratifying to contemplate, it would render lighter and more agreeable the situations of cooks and housemaids. It appears that the progress made in lighting private houses by gas has been much greater in Edinburgh than in London; though in the latter city there are some houses (for example, that of Mr. Hicks, 18, Wimpole Street,) most beautifully and perfectly lighted up with it. Our correspondent, Mr. Robison, speaking on this subject, observes, "I have long looked on lighting by gas as the most elegant and comfortable of all our domestic improvements. Every stationary light in my own house is of this sort, and I have never experienced any inconvenience from it, except sometimes the heat; and that I have now done away with, by carrying away the hot air from the ceilings of the drawingrooms between the lathing and the wall, through openings made over the architraves of the windows, where they are concealed by the draperies. The walls and ceilings of my drawingrooms are enriched by gilding, and there are multitudes of gilt frames, and the draperies are of silk damask of a bright tint; yet nothing has been injured by the gas, although some part of the family use the rooms all the year round. The dining-room is lighted by five argand burners, which have been in regular use since the year 1825, when the ceiling was painted in cream-tinted flat oil colour, which is still as fresh in the middle of the room as in other parts of it, and this could hardly be the case if any smoke necessarily arose from the gas. I am aware that both the gas and the gas fittings are better made in Edinburgh than in London; but I am confident that, even as you are, you might, by a little care, prevent almost all the inconveniences you complain of. Nine

tenth of all the dirt and smoke produced from gas lights are from the careless way of lighting the burners without taking off the chimneys (funnels). If the cock be fully turned before the match be applied, the gas catches fire with a sort of explosion, and a cloud of dense black smoke is formed: if this be repeated daily on a number of burners, it is no wonder that a ceiling should become coated with soot in a short time. The method I cause my servants to follow is this: every night, when the lights are put out, the chimneys are taken off, and little metal caps are put over the burners to keep dust from settling on their holes while not in use. When they come to be lighted next morning, the caps are taken off, a match is applied, and the cock turned sufficiently to let the gas *just* catch fire, but no more; the chimney is then set firmly in its place, and the flame raised to two inches high, at which height, if your burners and chimneys be properly proportioned in number of holes and area of openings for air, you have nearly a maximum quantity of light in proportion to the consumption of gas." Fig. 1836 is one of the best and most easily managed burners and chimneys in use in Edinburgh. In this figure, *a* represents the screw on which the burner is fixed; *b*, the burner, drilled with twenty-four holes; or it may be drilled with thirty holes; in which case, if the funnel be diminished one fourth of an inch in diameter, it will burn most beautifully,



1835



1836

but the flame must be lighted and extinguished very gradually, in order to prevent cracking; c is the bell of the glass chimney, which is ground inside to the height of the burner, in order to conceal it. A burner of this sort may be placed over each pier of a chimney-piece, as in fig. 1835. Fig. 1837 is the gilt metal cap which is put over the burner in the daytime, when the glass chimney is removed. In fitting up gas apparatus in private houses, Mr. Robison observes, "great advantages result from having the tubing and joints well executed, and of large capacity. Drawn block-tin tubing is the best and safest. Copper tubing is much dearer, and is very apt to become leaky. York cathedral is fitted up with copper tubing, which has been made of confined diameters to limit the expense; and, although it has cost much more than it would have done if it had been fitted up with tin tubing of due capacity, it will not give the

same satisfaction, and may even lead to accidents from leakage in the confined space of the crypt, where the principal part of the tubing is laid."

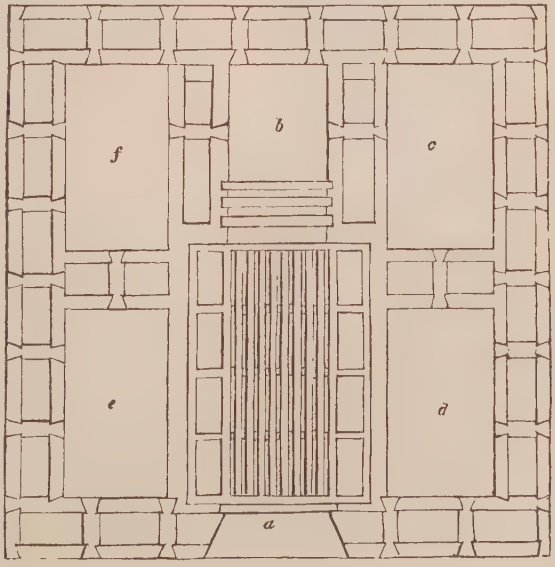
2056. *The Heating of the Rooms of Villas* embraces the general heating of the air of the house by a stove, or by a hot-water or steam apparatus, placed in the basement story, whence the heat ascends into every part of the house; and the heating by open fires, or stoves of some kind, every particular room. We shall first notice a few of the plans for general heating, and afterwards give one or two designs for open fireplaces.

2057. *Among Stoves for general Heating*, to be placed in the basement story, one of the most powerful is Mr. Sylvester's, as used in the Derby Infirmary, and fully described in his *Philosophy of Domestic Economy*. A substitute for this stove, which is employed in the large mansions built by Mr. Thomas Cubitt, in the neighbourhood of Belgrave Square, London, is formed entirely of cast iron, cast in lengths, which fit into each other, without requiring screws or rivets, and which for the sake of durability, are upwards of an inch in thickness. The construction is simply a furnace, or closed fireplace, with an upright flue which rises to the height of five or six feet above it; then turns downwards as low as the level of the fireplace, and next turns up, and at a convenient height enters the chimney flue. A stove of this kind costs a good deal at first, but, being of great thickness, it is very durable, and retains a great body of heat. The fireplace being small, the iron is never so heated as to decompose the water of the atmosphere; and the whole is so strong, simple, and so easily managed, that it cannot be broken, or put out of repair by servants. One of the greatest objections to all new stoves, and other improvements which are to be managed by servants, is their liability to be injured or put out of order by them; partly from their extreme ignorance of the nature of the objects to be taken care of, but chiefly, we believe, from their carelessness, and that utter disregard for the interest of their employers, which is the consequence of the great distance at which they are kept, and the manner in which they are treated; evils which can only be cured by the universal diffusion of education, and the comparative equalisation of wealth.

1837

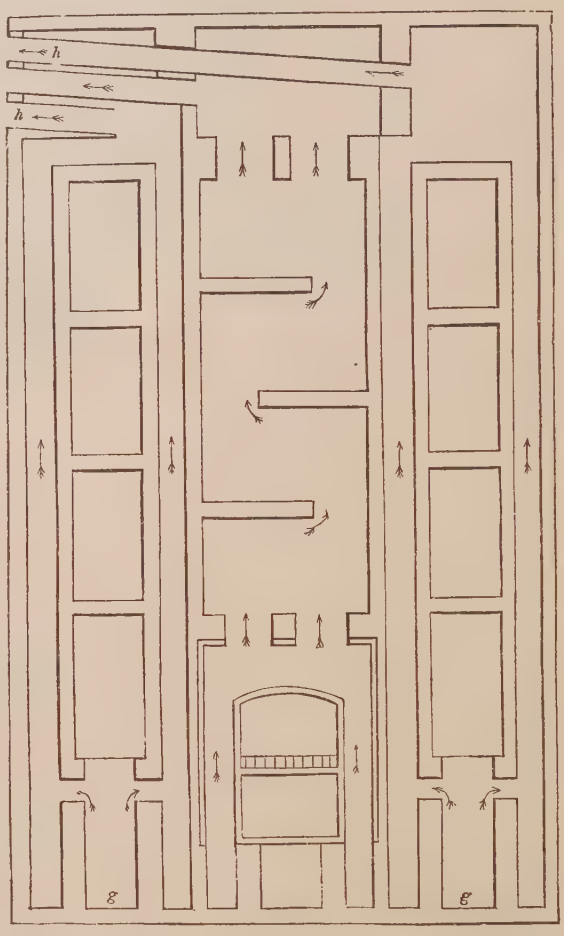
2058. *The German Stove* is one of the most economical which can be used for general heating; but it is troublesome to build or repair, in countries where the generality of bricklayers are unaccustomed to it. German stoves are remarkably well put up by a London stove-builder, Mr. Selane, Vauxhall Road, who has furnished us with the plan, fig. 1838, and the section, fig. 1839. In the former, *a* is the furnace; *b*, the first column of smoke-flue which rises to the height of six or eight

1838



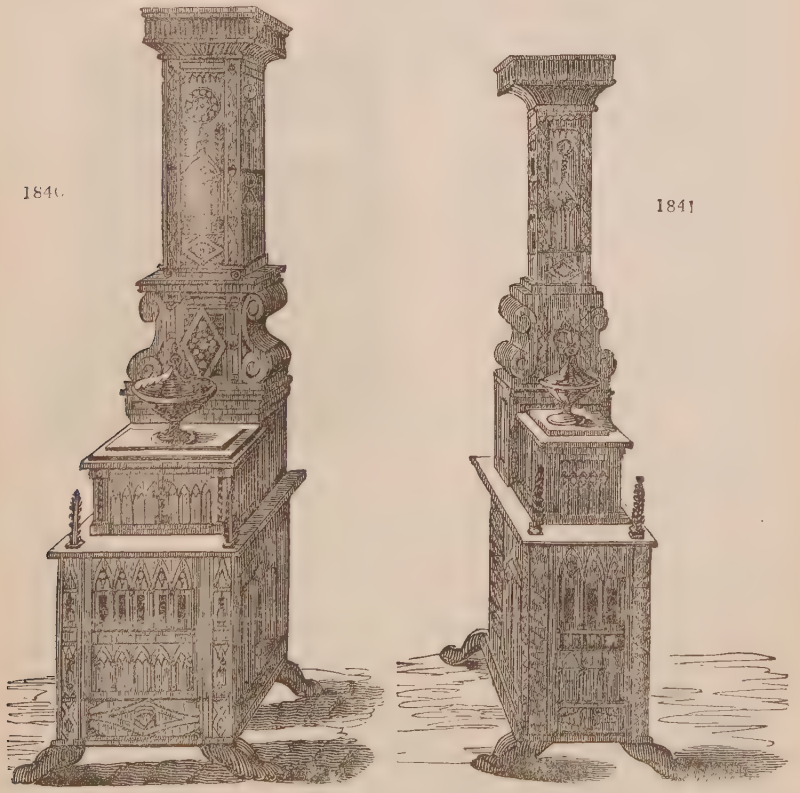
feet, and descends by *c*, again rising by *d*, descending by *e*, and finally rising by *f*, whence it passes into the chimney-flue. The walls of the partitions of this flue are of brick on edge; and the bricks used are of a particular quality, obtained by washing the clay, and mixing it with fine sand, which admits of their being cut, or sawn, so as to form the dovetails shown in the plan, fig. 1838. The air is heated in the spaces between the smoke-flues, it entering at *g*, in the section, fig. 1839, and passing off into a trunk, or other means of dispersion, at *h*. These stoves are both agreeable and economical, and they may be designed in the most architectural forms. Some, built by Mr. Selane, who also manufactures a very beautiful description of vases, and other ornaments in artificial stone, have the outside casing of that material; and these are well adapted for entrance halls and staircases. It must be confessed, however, that in countries where coal is the principal fuel, the flues of German stove become so soon coated with soot, that they either do not give out the necessary supply of heat, or they require to be cleaned (which cannot be done without the aid of a bricklayer) so often as to add greatly to the expense of using them. In Germany, where wood is always employed for fuel, and consequently for heating these stoves, they are found to answer admirably. In Britain, the best substitute for wood is coke. In most cases, we should prefer a hot-water or a steam apparatus, for the general heating of a house; but still there are situations in which a brick stove may be found most eligible, and under such circumstances we know of none equal to that of Mr. Selane.

1839



2059. *Nott's Stove* may either be used for general heating, or for the heating of single rooms. The following description of this stove has been sent us by Mr. Nott:—"The production and the application of heat are two distinct processes, requiring distinct arrangements and localities in the construction of a stove. The producing part of any apparatus may be considered as a prism, or cylinder, of about thirty inches in height. The interior is composed of fire-brick, and the exterior of iron. The cavity for receiving coals is nearly twenty inches in height, rising from a base of six inches by seven inches, or ten inches, as the case may be. The coals are put in at the top, and rest upon a grating of peculiar construction. It is intended that the coals should be ignited at the bottom, and the draught is through a lateral outlet immediately above the grating. Three fourths of all the fuel lies above this outlet, and, as the draught is not up through the incumbent fuel

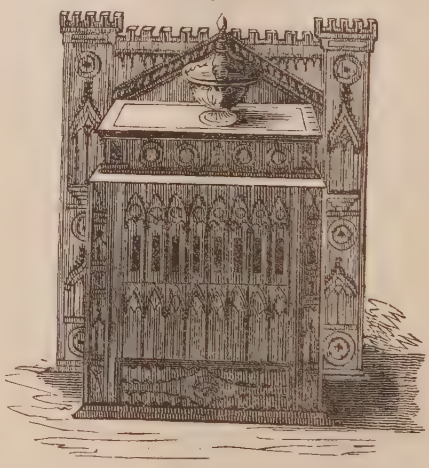
this part (the three fourths) will not become ignited; but will remain as a supply to the fire; gradually becoming heated, and gradually sinking down to supply the place of the lower portion which has been consumed. By elongating this chamber at its upper extremity, it is apparent that this principle may be carried to any extent; and that a reservoir of coal may be formed, which will supply a continuous fire, for ten, twelve, or any number of hours, or even days, if necessary. Upon the top of this pile of heating coal there is placed a movable ceiling; consisting of an iron or brick slab, which descends as the pile of coal sinks. The effect of this movable ceiling is, to keep the air that enters through the crevices of the stove from acting upon the coal lying above the outlet; either by cooling it, or by supplying it with the means of combustion. The foregoing arrangement insures the continued supply of heated coal, after an hour or two has elapsed; and the next thing to be pointed out is the contrivance by which a constant supply of heated air is obtained for supporting combustion. This last is a condition of the greatest importance; for a much greater amount of heat is produced by burning *hot* coals with *hot* air, than by an opposite arrangement. The grating before mentioned, as supporting the coals, is of peculiar construction. It consists of thin bars which are segments of circles bolted together; and the whole, when bolted, is sustained by an axle protruding through one side of the heat producer, or fuel-chamber. To this protruding end of the axle, a winch is applied; so that the grating may be either rocked from side to side, and thus sift the ashes into the ash-drawer beneath; or else it may be turned round, and thus empty the fuel-chamber of its contents. The meshes of the grating, being thin and numerous, present a great extent of heated surface; by passing over which the air is heated as it enters the stove. In one word, this rotatory grate approaches as nearly as



possible to the wire gauze of Davy's safety lamp, and its operation is precisely the converse of that of the wire gauze. In the lamp, the flame is cooled as it issues through the meshes of the gauze; in my stove, the air is heated as it issues through the numerous insterstices of the grating. In the front of the fuel-chamber is placed a fine vertical grating, covered with a sash glazed with talc, of several inches square, by means of which

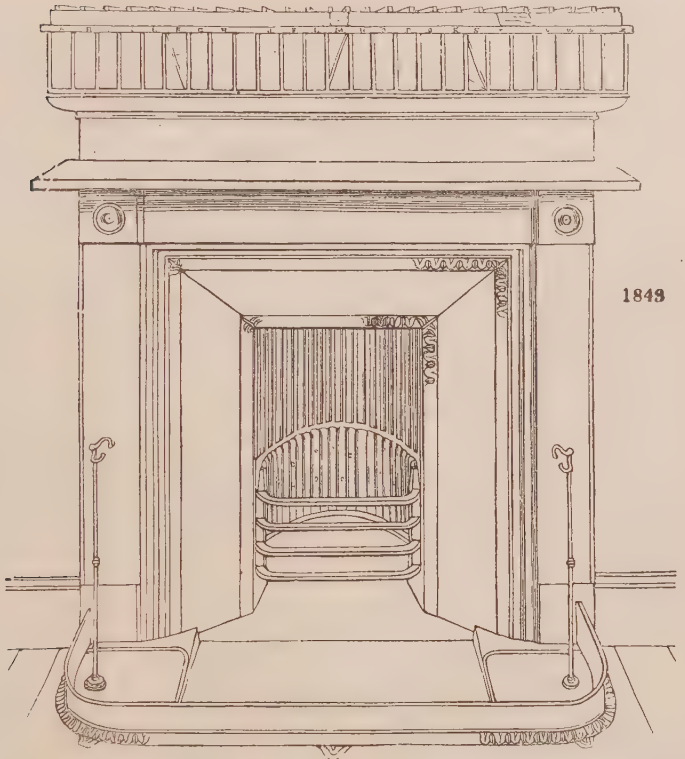
the fire is seen, although burning in a close stove. Having shown in what manner heat is produced by this stove, it remains for me to describe the receiver, or that portion of it by which heat is applied. The receiver is connected with the fuel-chamber, at the lateral outlet before mentioned. It is made of iron, and sometimes consists of one vertical tube, sometimes of numerous parallel and vertical tubes, and sometimes of one or more tortuous tubes or pipes. But, whatever may be its form, three things are uniformly observed in its structure; viz., to expose the greatest possible surface to the cooling agency of the air, to govern the extremity of the tube with a damper, which has the double office of regulating the rate of burning, and of compressing the elastic contents to facilitate the escape of the heat; and, lastly, to attach a ventilator, which, upon being opened, allows the air of the room to enter the receiver, and thus at the same moment cools it and ventilates the room. A review of the foregoing imperfect description, and an examination of the stove itself, will convince every one of the novelty of its structure. It differs materially from the furnace of Watt, and that of Perkins; the only ones to which it has any resemblance, even in shape. As a practical proof of the soundness of the principles here detailed, it may be mentioned, that stone coals, and even black lead, burn with freedom in these stoves, though with only a moderate draught, while the same description of fuel requires an intense draught to be imperfectly consumed in ordinary stoves." Figs. 1840 and 1841 are perspective views of two forms of Nott's stove, suitable for situations where height can be obtained. Fig. 1840 is six feet nine inches high, two feet wide in front in the lower part, and one foot seven inches thick, and costs ten guineas. Fig. 1841 is six feet four inches high, one foot five inches and a half wide, and one foot five inches and a half thick; and costs eight guineas. Fig. 1842 is a form adopted in situations where much height cannot be obtained, or as a handsome substitute for an open fireplace: it is three feet one inch high, two feet nine inches wide, and one foot two inches thick; and costs twelve guineas. Wherever an iron stove is to be used, we are inclined to believe that this will be found the most economical: it is decidedly the most scientific in its construction, and, having had one of them in use for a short time, we can assert that the shining of the fire through the talc window has a very cheerful appearance.

1842



2060. *Other Stoves* might be mentioned, possessing different degrees of merit. One, in the form of a vase, invented by Burges, and manufactured at Birmingham by Gough and Rowan, has been strongly recommended, as showing the fire, and radiating heat through openings in the cover of the vase, yet not heating the iron so strongly as to decompose the water in the air of the room. The common Dutch stoves, formed of thin plate iron, and covered with a casing of the same material about an inch distant from the stove and its tube, we know to be very economical and effective, where charcoal, or fuel which burns well and produces very little smoke, is used. By means of the casing, a continual current of air is kept passing over the heated surface, and thus rapidly carries off the heat, and disperses it through the room, or wherever it may be desired.

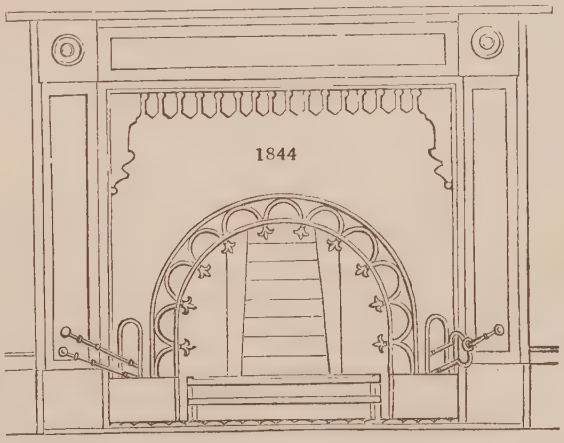
2061. *Moser's open Fireplace for Rooms* we consider one of the very best that has been invented. Fig. 1843 is one of the plainest kind of these grates, which we have had in use in our library for upwards of five years, to our entire satisfaction. The fluted back and sides of the fire-chamber are formed of fire-clay in four lumps: two of these, which enclose the lower part, are thicker than the others, and form a secure basis for them to stand on, without any description of fastening. These blocks are manufactured by Tatnell, Whitecross Street, Southwark, London, at the rate of 46*s.* for a fireplace of the dimensions of that figured. They are also manufactured at Stourbridge, and may be made wherever fire-loam or fire-clay (which is an argil very free from sand) can be procured. Our fireplace was furnished by Mr. Methley, ironmonger, of Frith Street, London, successor to Mr. Moser. The card-case shown over the mantel-shelf may be worth the notice of Architects and other professional men. The lower range of divisions



1843

is for the cards of tradesmen, which are generally large, and the upper for those of private persons. On the small projecting shelf between them are placed the cards of persons who have called in the course of the day, or of persons whose names and addresses it may be desirable more particularly to impress on the memory.

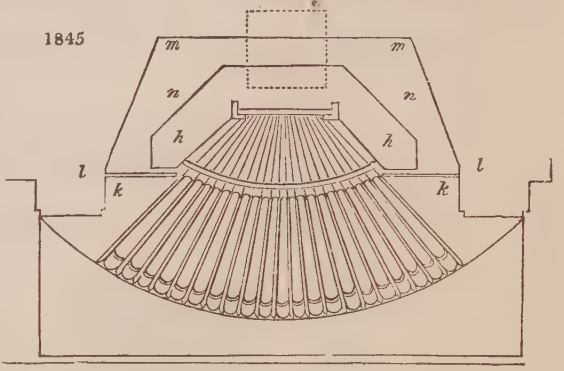
2062. *Sylvester's Fireplace* exhibits one of the last improvements in this mode of generating heat. It presents a return to the primitive simplicity of making fires on the hearth, but it has joined to that simplicity a beautiful application of science. One of the greatest novelties in the appearance of this fireplace, fig. 1844, is, that it has no fender. Fig. 1845 is the plan of the fuel-chamber, and a vertical profile of the hearth; in which the latter is shown composed of radiating spokes of cast iron, the narrow extremities of which serve as the bottom bars of the grate. Fig. 1846 is a section through the centre of the fireplace, in which *a* is the broad part of one of the spokes mentioned; *b*, the narrow



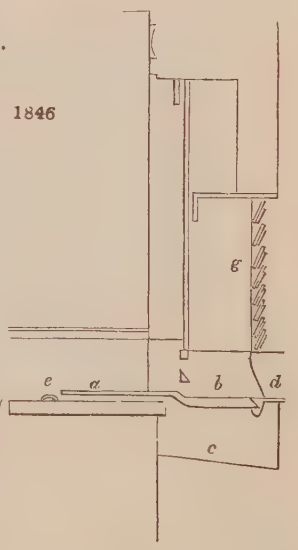
1844

part forming the bottom grate of the fire; *c*, the ash-pit, which is large enough to contain the ashes made during a week; *d* is a piece of firestone, or fire-brick, forming the back of the fuel-chamber; *e* is an orifice by which air enters under each spoke to the ash-pit, and, rising up among the bars, *b*, supports combustion; *f* is the hearth-stone; and *g*, cast-iron plates, placed like luffer-boards, which form the back of the fireplace. These plates are all movable: and their use is to regulate the draught, by dividing the current up the chimney. In ordinary cases, the whole of the plates may remain as in the figure; but where it is desired to increase the draught of the fire, by taking out only two of these luffer-plates at the bottom, next the firestone, *d*, a draught will be created like that of a close furnace; and hence it is, that this fireplace will cure any smoky chimney whatever. In the ground plan, fig. 1845, it will appear that the two sides of the fireplace, *h h*, are not in contact with the jambs, *l*, or the back, *m*; in consequence of which, much heat will be radiated into the space *n*, and will pass into the room through the openings of the sides, *k k*. The use of the screen shown in fig. 1844 is to conceal the openings between the fuel-chamber and the jambs; yet, at the same time, to admit of the free circulation of the air. These stoves are of such very recent invention (1833), that little can be said respecting them from experience. From theory these stoves appeared to us superior to all other open fireplaces; and we accordingly (in 1833), had one of them, *fig.* 1844, put up for our own use. After above a year's trial, however, we found several objections to it, and have now (1835) replaced it with one of Methley's, of the same general character as *fig.* 1843.

1845



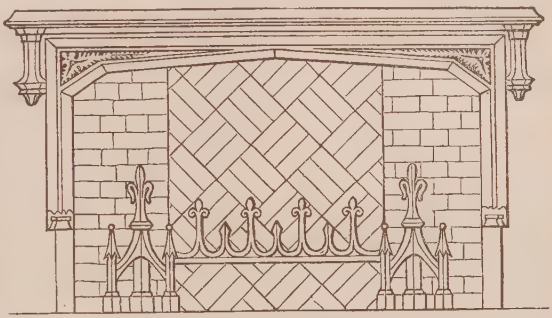
1846



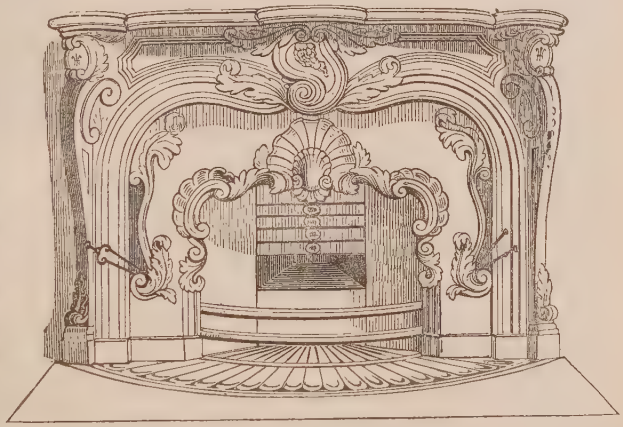
2063. *Chimney-pieces* are conspicuous fittings-up of the rooms of villas. As we have already given several both in the Gothic and in the Grecian styles, we shall here only observe that of late they may be obtained of different kinds of marble, at much less expense than formerly, in consequence of the application of machinery to the sawing and polishing of that material. In the London marble-works at Millbank, Westminster, such chimney-pieces as those shown in figs. 1843 and 1844, which cost us, at the trade price, in 1824, seven and ten guineas, may now be obtained for four and six guineas, and of better workmanship. Designs of greater intricacy, and requiring much manual labour, such as those of the age of Louis XIV., which abound in curved lines; and those in the Gothic style, which abound in carving, are not cheap in proportion: nevertheless, they are also now very much lower than formerly; partly in consequence of the diminished price of manual labour, but principally on account of the importation of many of the chimneys of Louis XIV.'s time, from France, where they have been taken from the mansions of the decayed noblesse. America and other countries might import such chimney-pieces, both from France and Italy, at a very low rate; or they might send designs to Genoa, Leghorn, or Bordeaux, and have them executed in the native marbles of either country, at less than what Portland stone costs in England. Some fine specimens of chimney-pieces in foreign marble, at low prices, are generally on sale at the richly stocked museum of Mr. Brown, the scagliola manufacturer, in University Street, London. We recommend to young Architects Mr. Robison's plan of having a sort of upper chimney-piece over the lower one, for forming a frame to the mirror usually placed over fireplaces. The most magni-

ficent designs might be formed from this idea. Fig. 1847 is a chimney-piece and grate, furnished by Mr. Lamb; the object of which, he says, is "to show what can be done in the adaptation of ancient forms to modern customs. This grate represents as nearly as possible the andirons and creepers (terms for the dogs, or fire-irons, for supporting logs of wood in open chimney-pieces) used for burning wood in former times; and it, at the same time, possesses all the requisites for burning coals." Fig. 1848 is a Design for a chimney-piece in the style of Louis XIV, fitted up with one of Sylvester's open grates, and with one of the front screens required for those grates, in the same style. It will be seen that this grate differs in some respects from that shown in fig. 1844, and that two of the luffer-plates are removed. This rich Design is by Mr. Lamb. Some hundreds of marble chimney-pieces in this style, and in that of Francis I. (which differs from that of Louis XIV. chiefly in giving greater elevation to the chimney openings), have been lately imported by Nixon and Son, Great Portland Street, London. These upholsterers more particularly devote themselves to furnishing in the style of Louis XIV.; a style which, though unsuitable for persons in moderate circumstances, yet, could we indulge in it, we would display in one room, as we would all the other distinctive styles in so many different apartments. Our *beau idéal* of an amateur Architect's house is, a display of all the styles of Domestic Architecture, that have ever existed, in distinctive masses on the exterior; and of all the styles of furnishing, that have ever existed, in separate rooms in the interior. This would be to the Architect such a practical school of his art, as the representative system of the whole vegetable kingdom, which we have in our small garden at Bayswater, is of botany to the horticulturist. There are few or no Architects, however, in the world, that could afford to indulge in such a school; but the idea may afford a useful hint to some wealthy citizen of America, who may wish to leave a sort of architectural museum to his native town. We mention America, because such a museum would be a much greater curiosity there than in Europe; and we suggest the idea of leaving it to a town, to prevent the risk of dispersion in a country where, happily for the inhabitants, there are no laws either of entail or primogeniture.

1847



1848



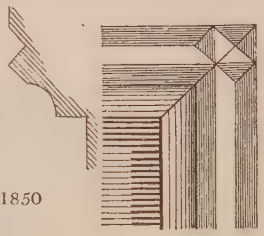
2064. *The Ventilation of Rooms* is equally imperfect with the usual mode of heating them; because the air, being carried off by the chimney, can never be much changed higher than the chimney breast. The whole of the stratum above this height must remain, when fires are used, comparatively unchanged. To remedy this evil, it is requisite to have ventilators, concealed in the cornice or ceiling, communicating with

flues adjoining the smoke flues, in order to create a draught: a valuable addition to this plan would be, to have the fires principally supplied with air from tubes descending to the basement story, and opening there into a large air drain; such tubes, of course, having regulating cocks. The nearest approach to this arrangement seems to be that of Mr. Sylvester's open fireplace; in which combustion is supplied from a thin stratum of the heaviest air of the room, which slides along the floor. With Mr. Sylvester's open fireplaces, and concealed openings for ventilation in the cornices or ceilings, connected with flues, so placed alongside of other flues as to create a draught, the system of ventilation might, we think, be rendered as perfect as could be reasonably desired. This, we know, was the opinion of the late eminent Mr. Tredgold, with whom we have had much conversation on the subject. (*Walk. Rem.*)

1849

2065. *The Wainscoting of Rooms* in the Gothic style is a source of very great beauty, and might afford excellent opportunities for admitting fresh air, and withdrawing that contaminated by respiration. In some cases, pipes of steam or hot water are concealed behind the wainscoting, and clothed with other tubes, in order to heat the room, without showing the apparatus, by creating on the surface of the inner tube a current of heated air, on the principle of Mr. Perkins's lining to his steam boiler. When the pipes are clothed, this mode is very effective, but not so, as Mr. Mallet has observed, when they are left naked. On the whole, we prefer an imitation of wainscoting in plaster, painted to resemble oak, elm, maple, or other wood, and introducing the heat in ornamental vases or other vessels, as also suggested by Mr. Mallet, and practised by him and others. Fig. 1849 is an ornamental panel, supplied to us by Mr. Lamb, similar to those sometimes found in old English mansions, which may be easily executed either in plaster or wood. Fig. 1850 is an angle for a panel for a dado, or door, &c., of oak; a very neat manner of finishing in use among ancient joiners. This has also been furnished to us by Mr. Lamb.

1850



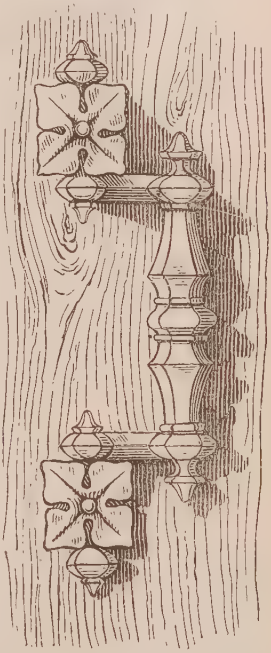
1851

2066. *Windows.* Much of the comfort as well as the beauty of a room depends on the manner in which light is admitted to it. Whenever the main object is to display pictures, the windows should never be continued down to the floor; because the light, when reflected upwards on the picture, is at the same time reflected on the eye of the spectator, and prevents him from seeing it to advantage. On the other hand, in the case of rooms on the ground floor, where it is desirable that the windows should open, so as to admit of going out

1852

on a terrace, or under a veranda, much of the comfort of the occupant will depend upon these windows opening like doors, in what is called the French manner. The mechanism of windows of this description has been carried to a high degree of perfection by Smith of Prince's Street, Haymarket, London. The great objection to French windows used to be, the difficulty of making them watertight, and even in some cases airtight; but these objections Mr. Smith has completely overcome. Such windows have another advantage; viz., that they are easily kept clean by common servants. Modes of fitting-in the upper sashes of windows so that they may revolve on centres, and thus be easily cleaned by servants from the inside, have been devised by Saul, by Tuely, and others: for the details of the first two methods, we refer to the *Mechanics' Magazine*, vol. i. p. 265, and p. 337.

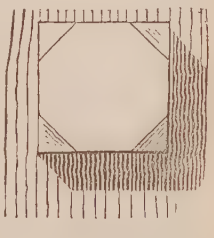
1853



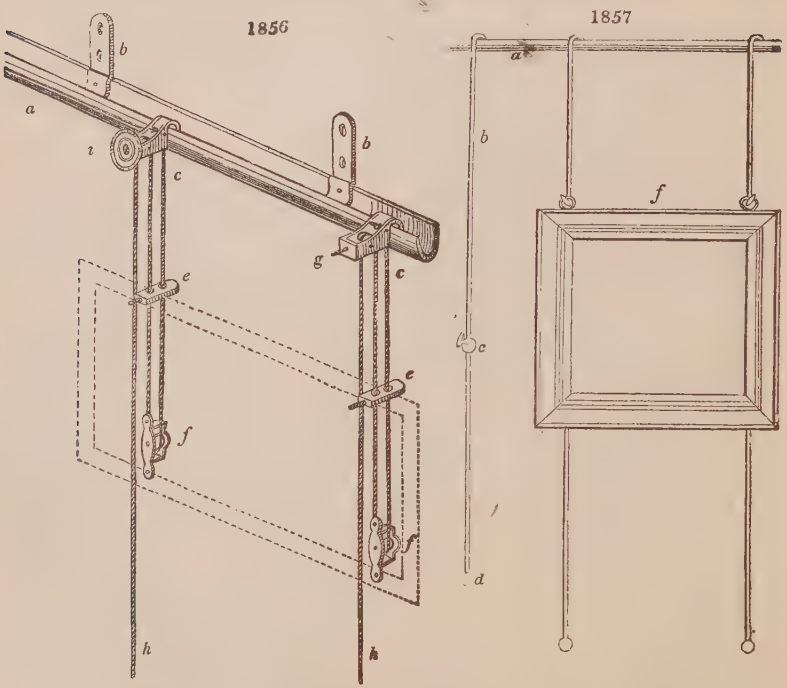
2067. *The Doors* to the principal rooms of villas should be hung with Redman's or other rising hinges, which are a great improvement, as they raise the door so as to make it to pass freely over the carpet. For outside doors to Gothic villas, Mr. Lamb has supplied us with the hinge, fig. 1851; the door-handle and keyhole, fig. 1852; the door, or drawer, handle, fig. 1853; and the nail heads, figs. 1854 and 1855. It is a great beauty in all buildings, but more especially in villas, to have the outside doors formed of some description of timber, which shall not require to be painted. An entrance door of heart of oak, with the handles and fastenings of iron, oiled, but not painted; or, what is preferable, of copper, left to be bronzed by the atmosphere, every one must feel to be much more architectural, and to convey a far greater idea of durability, than any description of material coated over with paint. There are some other British woods, such as chestnut, Scotch elm, and Highland fir, which might answer for the same purpose; and, among exotic woods, there is the New Holland mahogany, which only costs about double the price of deal, appears to be nearly as durable as teak; and is suitable both for outside and inside work, without any paint whatever. Mr. Perry has used this timber for the entrance door and the fittings-up of his own house; and he considers, that, as it requires no paint, it is ultimately as much cheaper than deal, as it is unquestionably far handsomer.

1854

1855



2068. *The hanging of Pictures in Rooms* is sometimes performed, in a clumsy manner, by means of brass-headed nails driven into the wall, in a line immediately under the cornice, from which the frames are suspended by cords. There are two improved methods, however, of effecting this, the first of which, as practised by Mr. Vokins, is as follows:— Fig. 1856, *a* is a hollow iron rod or rail, coated on the outside with brass gilt, of any required length, which is fixed or screwed to the wall by means of plates, as at *b b*, at regular distances. The pulleys, *c c*, have a broad hook, which fastens on to the rod or rail, and can be moved along it as the pictures are required to be shifted to the right or left; these pulleys have also small iron pins to which one end of each of the cords which support the picture must be fastened. Iron staples, *e e*, are screwed into the back of the picture-frame, having two holes in each to keep the cords or lines apart, and the frame from pressing against them. Pulleys, *f f*, are fixed to the bottom of the picture at each end; and at *g* are male screws on which brass ornaments, as at *i*, are fixed to hide the pulleys. It is evident that, by pulling the cords *h h*, the picture may be raised to any height; and may be moved along the rail, either to the right or left, at pleasure. The second method, which is found to be both neat and economical where numerous small pictures are to be suspended, is thus



described by Messrs. Cottam and Hallen: — Fig. 1857, *a* is an iron rod sheathed with brass gilt, about three quarters of an inch in diameter, which is fixed to the wall by kneed gilt studs immediately under the ceiling; *b* is a rod of brass gilt, about half an inch in diameter, and of such a length as to reach within about five feet of the floor; *c* is a ball or knob, about three quarters of an inch in diameter, which moves on this rod from one end to the other, but which can be made fast in any position by the screw *e*, the head of which serves at the same time as a hook on which to hang the pictures. It is to be observed that the centre of this ball coincides with that of the diameter of the rod, so that it keeps the latter at the distance of a quarter of an inch from the wall. The same effect is produced by the knob *d*, at the end of the rod. When small pictures are to be suspended, they may be hung by their centre of gravity one above another on a single rod; but larger pictures should be hung on two rods, as shown at *f*. By this mode of hanging, neither the pictures nor the rods touch the wall in any part; and, as the perpendicular rods may be moved along the horizontal ones, the position of the pictures may be shifted at pleasure. That the movement may not be interrupted, it is essential that the studs be kneed or angled, otherwise they will prevent the horizontal movement of the hooks of the upright rods.

2069. *On the Subject of Bell-hanging* we have nothing to add to what has been already mentioned, § 590 and § 1473; and by Mr. Vokins in his description of his Grecian villa, § 1858. The handles to bells may always be rendered highly ornamental.

2070. *Water-Closets.* "Where practicable, it is desirable that a communication should pass from the ceiling of every water-closet to a flue in the wall of the house, so situated, in respect to chimney-flues, that the warmth they impart should cause a rising current of air from the closet. Where a flue is made from the ceiling of the kitchen to carry off the heated air which accumulates there, it may sometimes be possible to lead the communications from some closets into it. When the water-pipes of a house, leading to these closets, are subject to being frozen, they should be placed in a flue or trunk through which warm air may be ascending from some source likely to be constant; or the main pipe, before it begins to rise, may be made to take a few circuitous turns in a fixed boiler, under which a fire may be kept in time of frost. The water in the boiler will of course keep the pipe hot, and will communicate sufficient heat to water flowing through it, to prevent accidents from freezing. If the boiler be large, and the coil long, heat enough may be given in this way to warm a bath, by regulating the supply cock so as to make the bath fill slowly. No accident can happen from the heat while the cocks are shut."

Chap. VI.

Of the Furniture of Villas.

2071. *In giving Designs for the Furniture of Villas*, our object shall be more to exhibit variety and display style, than to enter into the details of construction; because the patrons of this branch of Domestic Architecture require rather to have a direction given to their taste, than to have sources of comfort and economy opened up to them. It is almost unnecessary to observe that the principle of unity of expression requires that the style of the furniture should correspond with that of the house; but it cannot be superfluous to remind the reader, and especially the young Architect, of the necessity of the building and furnishing of a house being under the control of the same mind, and that this mind should be equally conversant with both departments.

2072. *The principal Styles of Design in Furniture*, as at present executed in Britain, may be reduced to four; viz., the Grecian or modern style, which is by far the most prevalent; the Gothic or perpendicular style, which imitates the lines and angles of the Tudor Gothic Architecture; the Elizabethan style, which combines the Gothic with the Roman or Italian manner; and the style of the age of Louis XIV., or the florid Italian, which is characterised by curved lines and excess of curvilinear ornaments. The first or modern style is by far the most general, and the second has been more or less the fashion in Gothic houses from the commencement of the present century; since which period the third and fourth are occasionally to be met with, and the demand for them is rather on the increase than otherwise. Till the commencement of the present century, the most gorgeous furniture in the great houses of England was in the style of Elizabeth, and made during the reigns of Henry VIII., Elizabeth, and James I.; or in the style of Louis XIV., and made during the reign of Charles II. All the gorgeous furniture in the great houses of France, and all the most sumptuous altar-pieces in the churches, were made during the reign of Louis XIV. In consequence of the first French revolution, and the recent changes in the fortunes of many of the English nobility, much of the furniture of these two styles, formerly almost exclusively used by the great, has been exposed to sale, and consequently has attracted the notice of gentlemen of less opulence; and this has called into exercise a taste among them which had lain dormant for many years. Hence it is that we have now upholsterers in London who collect, both in foreign countries and in England, whatever they can find of curious and ancient furniture, including fragments of fittings-up of rooms, altars, and religious houses; and rearrange these curious specimens, and adapt them to modern uses. Among these may be mentioned Wilkinson of Oxford Street, Hanson of John Street, and Nixon of Great Portland Street, who have curious collections; made not so much with a view to gain, as from the pleasure attending the pursuit of a favourite object. We have also a very curious work on the subject of furniture, chiefly prior to the time of Queen Elizabeth, by Henry Shaw, Esq., an artist of great antiquarian research, and devoted to the subject of displaying to the world the taste of our ancestors. The designs in this chapter for Grecian or modern furniture have been almost entirely made by Mr. Dalziel, and, indeed, have been executed in his manufactory; those in the Gothic style have been supplied by Mr. Lamb; and those in the Elizabethan style by Mr. Lamo and Mr. Shaw. We have given but few designs in the style of Louis XIV., on account of the great expense of carrying them into execution, and because we think a style distinguished more by its gorgeous gilding and elaborate carving than by any thing else, unsuitable to the present advancing state of the public taste. We should make nearly the same observations on the style of Elizabeth, distinguished by its rude and grotesque carvings, were it not that it is seldom necessary to manufacture objects in this manner, farther than by putting together ancient fragments which may be purchased at the sale of old buildings. Whoever in the present time (1833) wishes to furnish and fit up a house in such a manner as to produce a new and strange effect on the spectator, cannot attain his end at less expense than by having recourse to Elizabethan fragments. We shall arrange our designs in the order of Grecian and modern furniture; Gothic furniture; and furniture in the Elizabethan style.

Sect. I. *Grecian and Modern Furniture.*

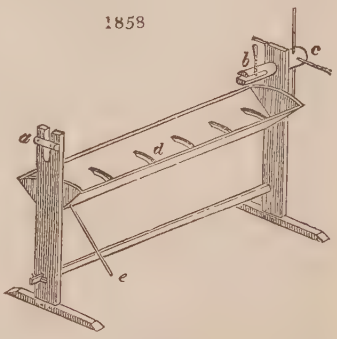
2073. *Modern Furniture* may either be arranged according to the rooms in which it is to be placed, or to the particular denomination of the furniture: we adopted the latter mode when treating of the furniture of cottages which consist but of few rooms; but we shall here take the former mode, and give, in succession, designs of furniture for the kitchen and offices; for the porch, hall, and billiard-room; for the parlour and dining-room; for the library; for the drawingroom and music-room; for the bed-rooms and dressing-rooms; and for the nursery.

SUBSECT. 1. *Furniture for Villa Offices.*

2074. *The Subject of Kitchen Furniture* may be considered as having been sufficiently noticed, when treating of that for cottages, farm-houses, and inns. The dressers and tables recommended for those dwellings require only to be enlarged for villas, and chairs are nearly the same every where, if their object be chiefly use. We shall only introduce one or two articles in addition to what we have already given.

2075. *The Wringing-Machine*, fig. 1858, we can from experience strongly recommend for small laundries. The articles to be wrung, when large, are taken out of the washing-tub, and, being passed over the pin at *a*, the two ends are put through the hole of the twister, *b*, which is turned round by the spokes, *c*. The water drops into the trough, *d*, from which it runs off into a tub or other vessel through the tube, *e*. When small articles are to be wrung, they are put into a coarse hempen bag, which is then treated as above mentioned. By means of this machine, which does not wear the linen more than common wringing, all the most laborious part of washing is done away with in small families, as it is by the larger machine, fig. 1262, in laundries on a large scale.

1858



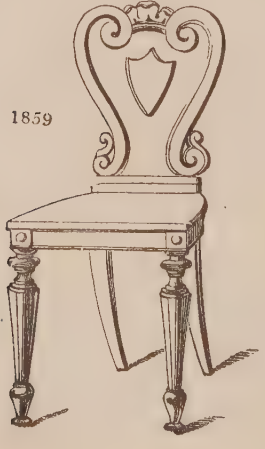
2076. *There are two Washing-Machines* for small families; one of which is the washing part of fig. 1262, on a smaller scale, and the other is fig. 1335, also on a smaller scale. We have tried both these machines, and find both good, the latter being best for small delicate articles. The objection brought against the lever machine is, that it wears out the linen; but this we believe to be chiefly prejudice, and in part neglect of putting into the machine a sufficient quantity of water. The barrel washing-machine, as manufactured by Weir and Co., and the wringing-machine, fig. 1858, are used in our family, and are found to save much labour, and not to do the clothes the slightest injury.

2077. *A Filtering-Machine*, portable or fixed, and of a temporary or permanent construction, ought to be considered essential in every family, whether poor or rich. We have already pointed out a cheap filter for the cottager, and there are several which claim the attention of the occupier of a villa. Mr. Melhuish, a plumber in Gray's Inn Lane, not only filters water by a very simple process in kitchens, but has an apparatus by which it may be filtered in ships, during their motion at sea. Mr. Struthers, in Parliament Street, manufactures a cheap, expeditious, and most excellent filter, the case of which is slate; an article which he also applies to the construction of milk-coolers, salting-troughs, dairy-tables, cellar-doors, and safes for the preservation of papers from fire. There are, besides, the portable filtering-machines of Robins and of other candidates for public patronage.

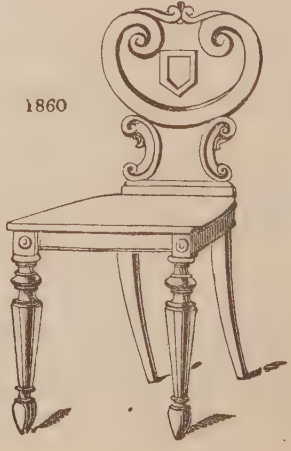
SUBSECT. 2. *Grecian and Modern Furniture for the Porch, Entrance Hall, and Billiard-Room.*

2078. *Chairs.* Figs. 1859 to 1862, to a scale of half an inch to a foot, are hall chairs,

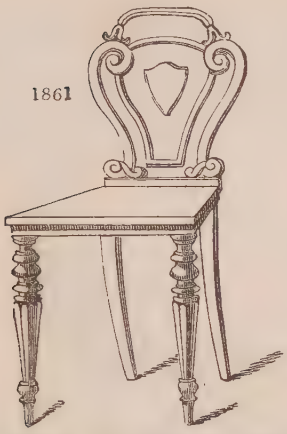
1859



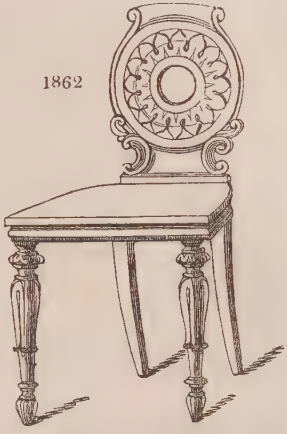
1860



1861

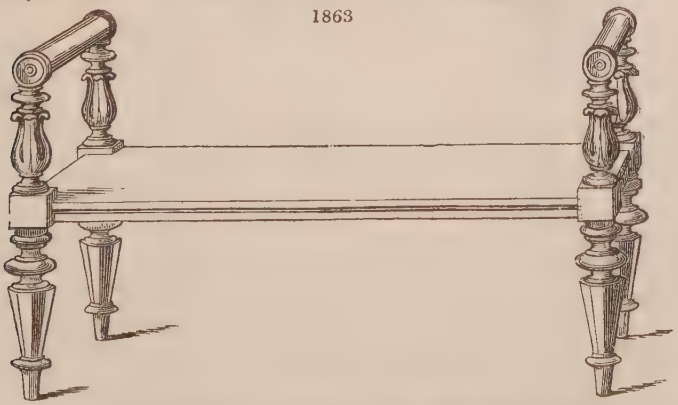


1862



which may be made either of mahogany or oak, or of deal painted and grained in imitation of the latter wood. In the backs are tablets or panels, for heraldic shields or crests, which are generally painted; but which have a more architectural effect when carved out of the solid wood, or when cast in composition, glued on, and painted afterwards. Chairs of this sort cost in London, in 1833, from 35*s.* to 50*s.* each. With respect to the taste of these chairs, we object to the front legs, as being too much ornamented for those behind. Who, on being shown the front legs, while the back legs were concealed, would ever expect to find the latter united in the same whole with the former? Certainly no one would do so who understood the principle of unity of style in composition. The reason why cabinet-makers are in the habit of bestowing so much work on the straight legs of chairs and benches, and so little on those which are curved, is, that the straight legs are readily ornamented at a cheap rate in the turning lathe; whereas, all the ornament that is bestowed on the curved legs must be carved by hand, at a great expense. The question is, how far the designer of a chair is justified in deviating from the principle of unity, for the sake of displaying more ornament than he would otherwise be able to show. Ask a cabinet-maker, and he will tell you at once, that his customers prefer the ornamented chair, and care nothing about the unity, or the want of unity, of style. Their great object is to get a display of rich workmanship, at as cheap a rate as possible. Our readers, we are sure, will agree with us, that this taste on the part of the purchaser is of a vulgar and grovelling kind, and ought to be corrected. This can only be done by enlightening the minds of the public in general on the subject of taste; and this is one of the grand objects of our work.

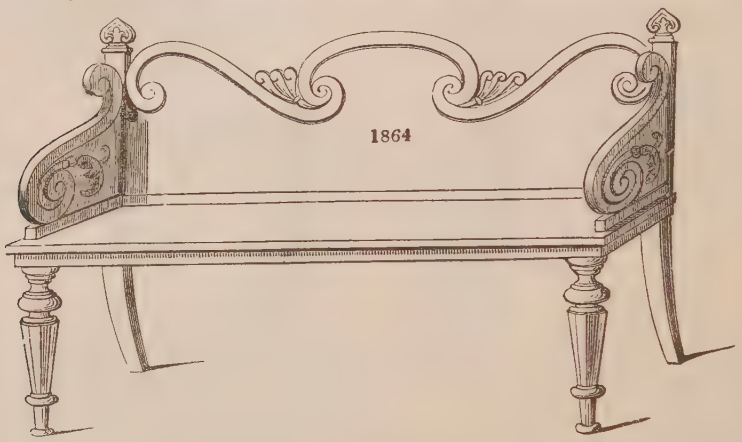
1863



2079. *Benches.* Fig. 1863, to a scale of three quarters of an inch to a foot, is a hall bench for a porch, or a small hall, where there is not much room to spare. This bench, made in London, costs from £3 : 10*s.* to £4 : 10*s.* The legs are all alike ornamented, as are the supports to the arms, so that there is a perfect unity of style

in these parts of the bench, and on the whole it affords a favourable contrast to the chairs in the preceding paragraph. The front edge of the seat ought to have been carved a little, to harmonise with the legs and arms.

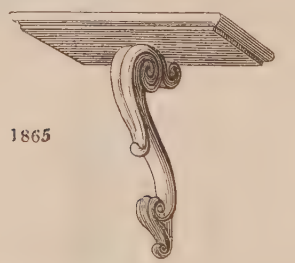
Fig. 1864, to the same scale, is another hall bench, in which there may be a tablet in the centre part of the back for heraldic insignia; and castors may be sunk in the legs,



1864

without being exposed to view. We consider this bench in very doubtful taste. In the first place, the outline of the back, which is a principal part of the composition, is the outline of a mere ornament; and ornaments, in all compositions whatever, ought to be accessories and not principals. We are satisfied that no man of correct feeling in matters of form, or who could apply the principles of design and taste (a connected outline of which will be found in our Fourth Book), would derive pleasure from looking at such a bench as this. We are informed however, by Mr. Dalziel, that he has made great numbers of them, and that the shape is considered very fashionable. The great recommendation to it, in the eyes of its purchasers, is the quantity of ornament which is displays. The unsuitableness of the front legs to those behind is sufficiently obvious.

2080. *Brackets.* Fig. 1865 is a bracket for holding a lamp: it may be made of oak or mahogany, or of deal, and bronzed. The upper moulding rises above the top, in order to prevent the lamp from being pushed off. Fig. 1866 is a side view of fig. 1865.



1865

1866

1867

Fig. 1867 is another hall bracket with a raised bead at top, which may be used either for supporting a lamp or a clock. The expense of these articles is from 20s. to 40s., according to the style of carving introduced. Hall brackets of the most beautiful forms may be executed in cast iron, and bronzed, as indeed may most articles of hall furniture. These brackets, the supports to which are in the style of Louis XIV., may be considered as in very good taste of themselves; but the style to be adopted in such articles must always be governed by the furniture and finishing of the apartment in which they are to be fixed.

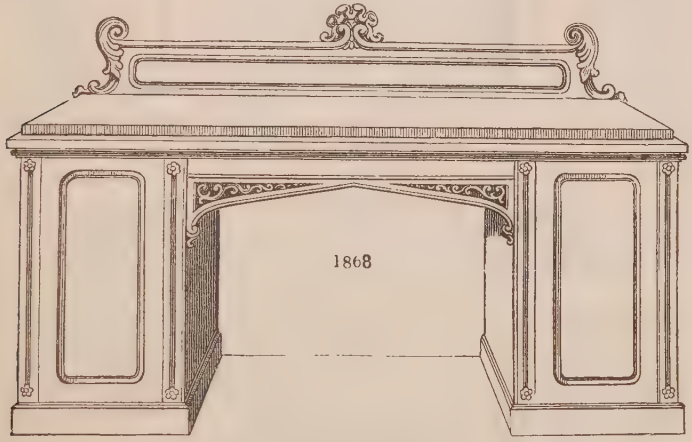
2081 *A Billiard Table* forms a useful source of recreation, both for gentlemen and ladies; and no villa ought to be without one. It may be placed either in the hall, if that be large, or in a room built on purpose, in the house, or connected with it by a covered way. There is a smaller sort of billiard table for moving about from place to

place; in which a spirit-level is fixed, and which contains screws for adjusting it to a perfect level; and large billiard tables are not unfrequently made of cast iron, the top being in one piece, which is planed smooth by machinery. In general they are made of mahogany, and covered with green cloth.

2082. *Tables for other Games*, such as bagatelle, trou madame, &c., which are kept in the hall, library, or other rooms, we have not thought it worth while to describe or figure; considering the billiard table to be the only desirable piece of furniture of this description, as contributing to the health of sedentary persons.

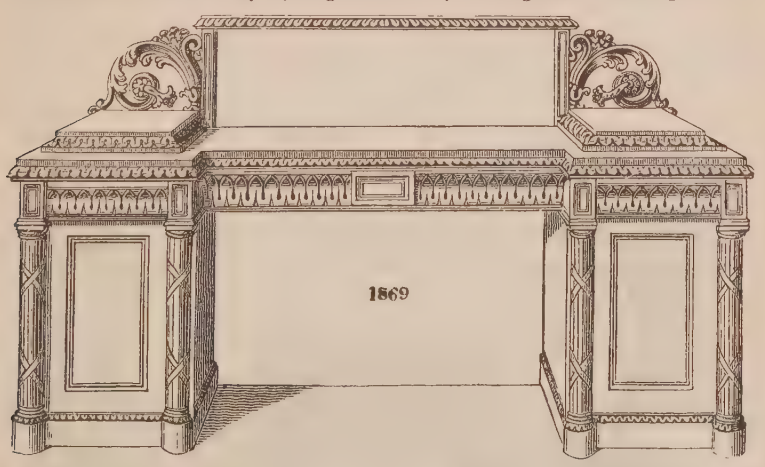
Subsect. 3. *Grecian and Modern Furniture for the Parlour and Dining-Rooms.*

2083. *Sideboards.* Fig. 1868, to a scale of half an inch to a foot, is a pedestal sideboard; there is a drawer in the centre, which pulls out by means of the lower part of the front projecting downwards, thus rendering a knob unnecessary. In the right-hand



pedestal there is another drawer, partitioned into divisions for holding decanters, and lined with lead, to hold ice round each bottle. The left-hand pedestal may have a drawer for plate, with tray shelves below it. The locks are fixed to the inside ends of the pedestals; and, therefore, are not seen in front. The linings to the keyholes are of wood, or brass bronzed.

Fig. 1869 is a handsome but rather expensive sideboard. The expense may, however be reduced without materially injuring the effect, by omitting the carved foliage attached



to the drawers. There may be a panel of looking-glass introduced in the back-board. A design of this kind will be spoiled, if the carving be not executed with skill and taste.

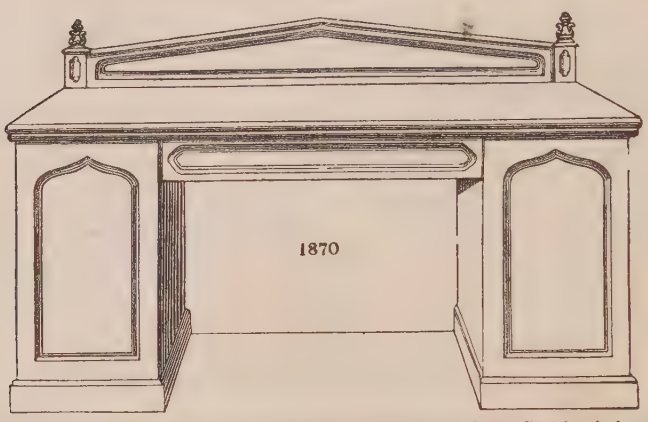


Fig. 1870 is a sideboard in what Architects call cabinet-maker's Gothic; it is neat and plain, but has no claim to merit in point of style.

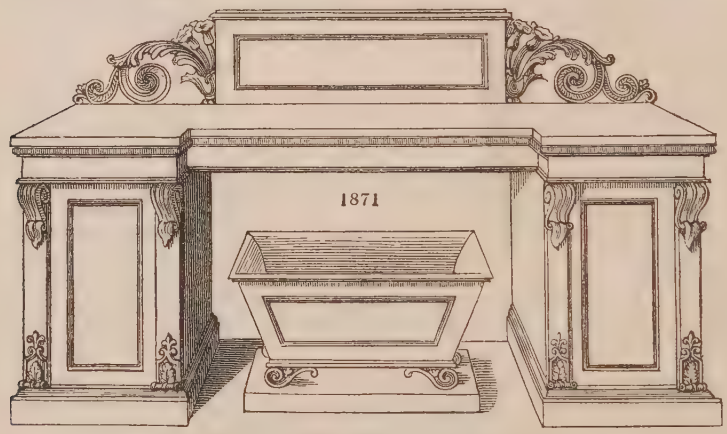
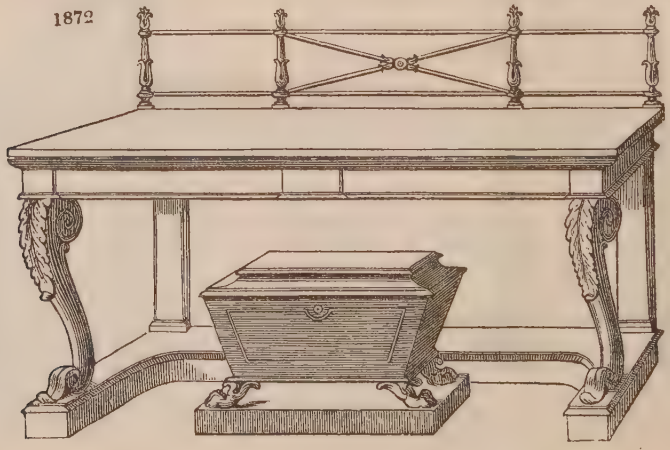
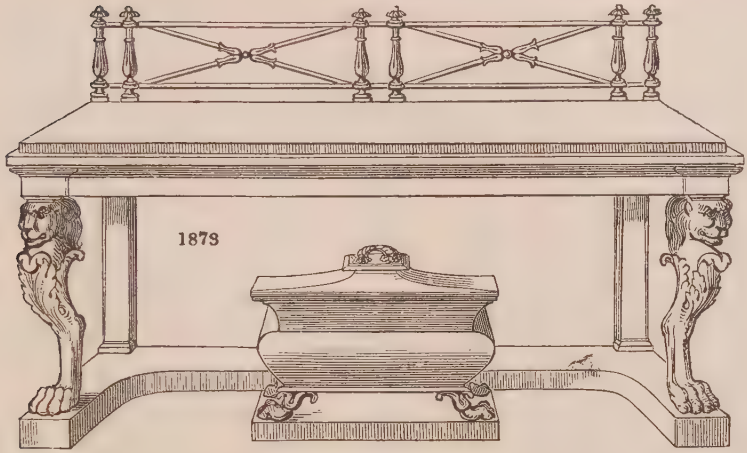


Fig. 1871 is a pedestal sideboard, with carvings at the back, and in front. There are four drawers under the top, and a cupboard at each end, divided as may be found most





1873

convenient. There is an open sarcophagus-shaped wine-cooler beneath, standing on a plinth. The inside of this wine-cooler may either be lined with lead, or it may contain a block-tin case, with handles, to lift out. Ice is frequently put into these wine-coolers, in order to surround the decanters or bottles set in them, when the wine is to be cooled. Castors are sunk into the plinth of the sarcophagus, that it may be drawn out from beneath the sideboard, and pushed in again at pleasure.

Fig. 1872 is a sideboard supported in front by carved scroll standards, rising from a hollow plinth; there are two drawers under the top, and bronzed rods at the back. A sarcophagus with a hinged lid below, fixed on a hollow plinth with castors, is partitioned and lined with lead, so that ice can be put round each separate bottle.

1874

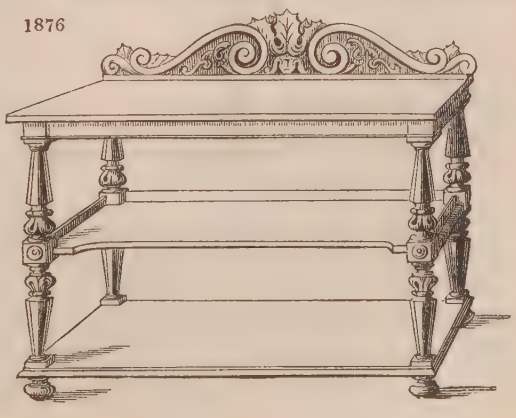
1875

Fig. 1873 is a sideboard supported in front by massive carved standards, with what is called a "shaped sarcophagus" underneath; the top of which lifts off by means of the carved handle. There are bronzed rods at the back of the sideboard.

Figs. 1874 and 1875 are end views of figs. 1872 and 1873; by which it appears that the carved standards are a good deal in the style of Louis XIV.

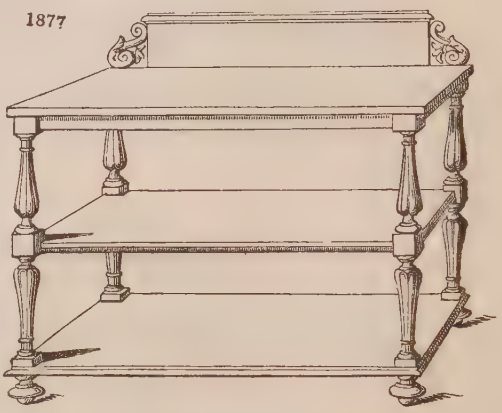
Figs. 1876 and 1877 are two small sideboard tables, usually placed in large dining-rooms, for the convenience of holding the dessert, the plate, the glasses, and other articles in use, while the top of the principal sideboard is covered with articles for display. These side-tables should always be placed on castors, for the convenience of moving them about from one part of the room to another; or out of the rooms occasionally, when they are covered with things to be carried away. Most of the articles in this subsection we consider in very good taste. There is not the

1876



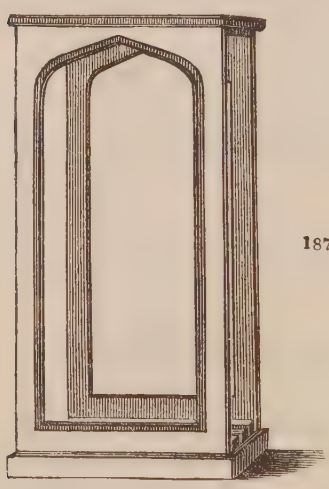
same objection to the front legs of figs. 1872 and 1873 being carved, and the back supports being plain, that there is in the case of chairs; because the sideboard is such a massive article as to be in effect a fixture, and the back pillars are always at such a distance from the eye, and so concealed by the top, as not to be conspicuous. Nevertheless, a little more ornament in the pillars referred to would be desirable. The scroll ornaments at the back of fig. 1871 are beautiful of themselves, but they are too conspicuous features in the composition, and aspire to being principal parts, instead of being accessories. Fig. 1868 is ornamented, and at the same time forms a harmonious whole, as does fig. 1869. We may observe that the plan of drawing out the front drawers in these sideboards without the aid of knobs, by avoiding the necessity of introducing these, adds much to the massive and architectural character of furniture. Fig. 1876 is handsome, rich, and harmonious. Fig. 1877 is elegant; we say elegant, because the supports, relatively to those in fig. 1876, and to those of tables for dining-rooms generally, according to the modern taste, are light; and the forms indicate great play of outline, and of light and shade, and, thus conveying impressions analogous to motion, may be called graceful.

1877

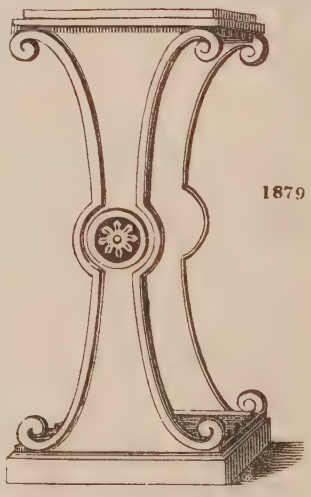


2084. *Table-flap Cases.* Figs. 1878 and 1879 are cases for holding the movable flaps of dining-tables. They may be made either of oak or mahogany, according to the

1878

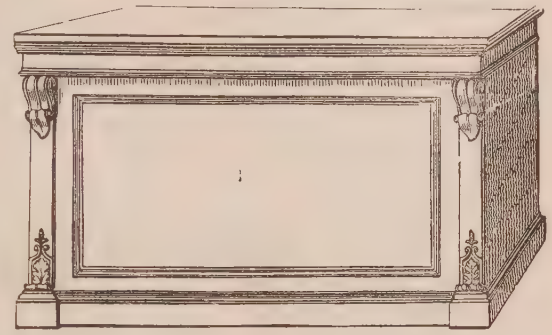


1879



style of the furniture in the dining-room in which they are to be placed. They are made open, in order not to exclude the air; and there are thin slips nailed on the bottom, and under the top, between which the flaps slide in, and which keep them from rubbing against or touching each other, and admit at the same time of a current of air to pass between them. The price of fig. 1878 is about 50*s.*; of fig. 1879 from £7 to £12. In some cases, the flaps of tables are kept in the upper drawer of the sideboard, the front of which falls down to allow them to be taken in and out; and there are slips on the sides, to keep the flaps apart. There ought also to be a concealed opening, the whole length of the front, at the bottom of the drawer, for the admission of air; and

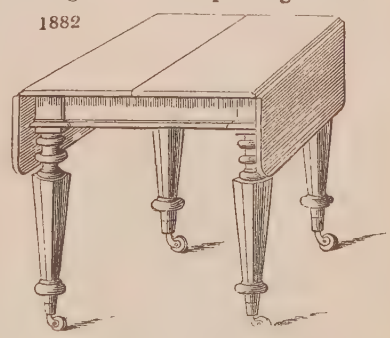
another, in the top part of the back, for its escape. Fig. 1880 is a sideboard case to be placed in a dining-room, for the purpose of holding the loose flaps of a dining-table; the top of which, in a large room, is useful as a sideboard. It is made to suit the style of the sideboard, fig. 1871. Fig. 1881 shows the top of this sideboard case lifted up; at one end may be seen the slips, between which the flaps slide in. The slips and the spaces between them are covered with green baize. The top is supported, when thrown open, by a quadrant, by which means one person can put the flaps in, or take them out. These are useful objects in families where large dinner parties are given. We give the preference, for our own particular taste, to fig. 1880, as being massive and architectural; and if care be taken to have the bottom open, and to have proper openings under the top to admit of ventilation, the flaps may be preserved from rotting in this case as well as in fig. 1878 or fig. 1879. Perhaps it might be worth while to steep such flaps in the deuto-chloride of mercury (corrosive sublimate), as suggested long ago by Sir Humphry Davy, and as recently employed by Mr. Kyan for the prevention of the dry rot, by neutralising the cause of vegetable fermentation.



1881

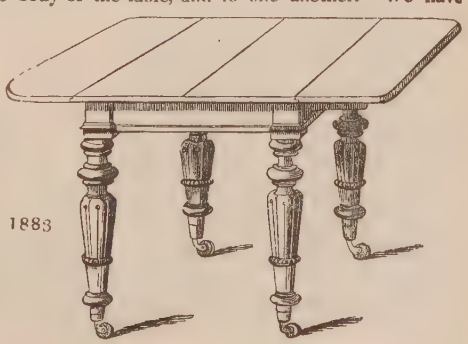
2085. *Dining-Tables.* The general form of these is regulated by that of the room in which they are to be placed; round or square tables being preferred for round or square rooms, and oval or oblong tables for oblong rooms. Round tables are sometimes made so as to admit of the addition of flaps or segments to their circumference, so as to increase their size at pleasure. These segments are secured, by lopers or other fasteners, to the body of the table, and to one another. We have alluded to a table of this kind as being in use in the villa, Design III. § 1749.

1882



Figs. 1882 and 1883 are small dining-tables, called cottage or Pembroke tables. They stand on four legs, which should be large and massive, and have good castors, or large wheels. They have two flaps, which fall down; and which, when up, are supported by fly brackets. They divide in the middle, and draw apart by means of lopers, or slides, of a peculiar construction,

1883



to any moderate length, from seven to nine feet, without requiring any additional legs for their support. Thus, a table may be made nine feet long by any width, say four feet, supported by four legs; and this length may be reduced in one minute, so as to form a table only two feet by four feet. The fork fasteners, by which the top flaps are fastened to each other, are placed at a distance from the edge, so as to be completely concealed, which adds to the strength of the table, and yet does not disfigure its appearance. These tables were invented in the manufactory of Mr. Dalziel.

Figs. 1884 and 1885 are tables also invented at Mr. Dalziel's. They may be placed together so as to form one square table, made fast by thumb-screws; or they may be taken apart, and placed against the sides of the room.

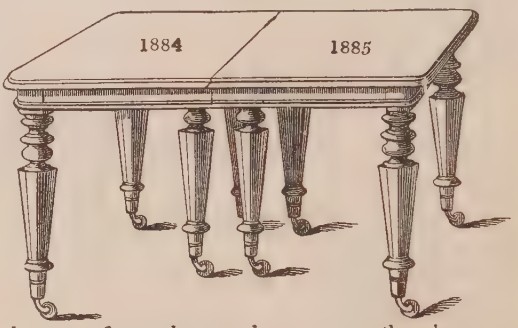
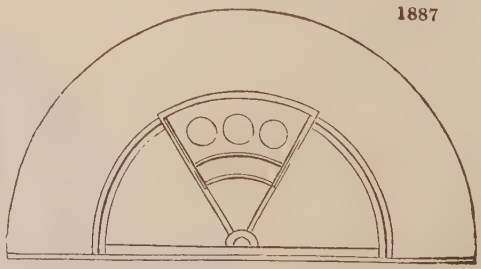


Fig. 1886 shows the under side of fig. 1885, in which *a a* indicate the situation of the two corner legs, and *b b* that of the two inner legs. It will be observed, that the two latter are so far within the edge of the top as not to come in the way of the feet of guests, and that the corner feet, such as *a a*, however near the edge, never offer any obstruction to the feet. Mr. Dalziel's dining tables are generally allowed to be of the very best kind manufactured in London. It is a great advantage to be able to draw out a table to the length of thirteen or fourteen feet, and to support the whole securely on no more than four legs. The advantage is, that such a table may be used where the floor is not perfectly level, as well as on one which is so; and this cannot be done so well with tables having six or more feet. This desirable result is obtained by compound slides, which, when drawn out to their full extent, form, in effect, a series of joists on which the flaps composing the top of the table rest. These tables are sent by Mr. Dalziel to all parts of the world.

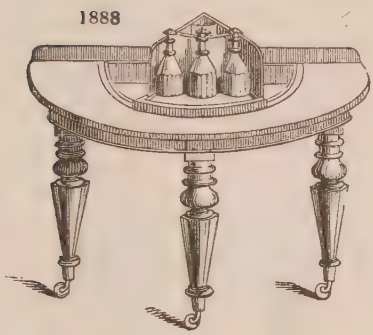
1886

Fig. 1888 is the view of a semicircular dining-table; and fig. 1887 is a plan of the top. It is chiefly used by gentlemen after the ladies have retired to the drawingroom. This table is then placed in front of the fire, with its convex side outwards, and the guests sit round that side, with their feet to the fire. It has a triangular frame which works on a centre; the broad end of the triangle sliding in a groove on rollers, so as to admit of the decanters being moved from side to side with ease. There is an open space between the decanters and the screen, which forms two sides of the triangle, and protects the decanters from the fire, in order that the wine may be kept cool. There are horseshoe tables for the same purpose, of a simpler description, but without the moving bottle-stand. The top of these tables is about eighteen inches broad, and not more than half an inch thick; the legs are slender and tapering, in order, not only to give an elegant appearance, but to render the tables light, and easily moved further from, or nearer to, the fire, as may be desired. The wine which stands on the common horseshoe tables is liable to be heated by the direct radiation from the grate, and thus to lose that refreshing coolness which is the great luxury of wine drinking, as contrasted with the use of malt liquors and ardent spirits.

1887



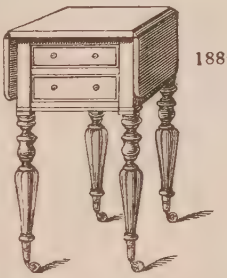
1888



" If with hot wine we insack us
Say our name 's not Bacchus.
Serve, serve up a dozen,
But let it be frozen." *Bacchus in Tusc.*

When such tables are used, if the party is not sufficiently numerous to finish a bottle before it has made twice the circuit of the table, it is, after the glasses are filled, set in a small vase or sarcophagus, which stands on the floor, and which sometimes contains ice, and at other times only water. Some, however, instead of a sarcophagus placed on the floor, make use of what is called an earthenware wine cooler placed on the table. This vessel, every body knows, is made of porous earth open at the top, and somewhat larger within than is sufficient to contain a quart decanter. The earthenware cooler is steeped in water for half an hour, previously to its being used; after which, being emptied and set on the table, on a small mat or on a stand of any kind, the decanter of wine is placed in it. The greater the heat of the fire, the more rapid is the evaporation of the water which has been absorbed by the porous earth; and consequently the greater the absorption, from the wine, of the heat which is required to carry on this evaporation. Earthenware wine-coolers of this description are manufactured by Peake of Tunstall, of very elegant shapes, and are sold at moderate prices.

1889



1890

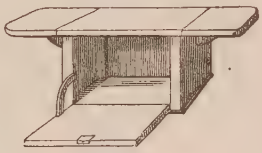
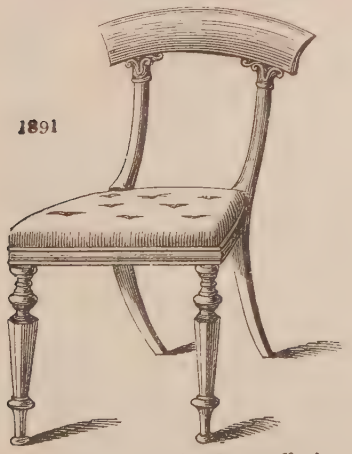


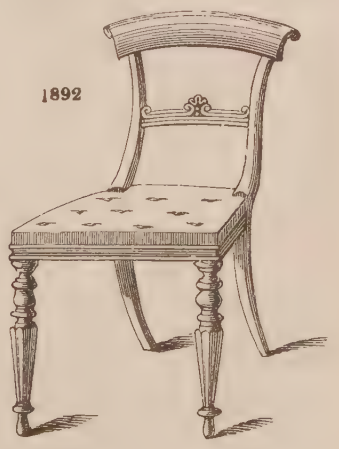
Fig. 1889 is a Pembroke table with two flaps; the front is made to imitate two drawers; but it falls down, and is supported by a quadrant, as in fig. 1890.

2086. *Chairs.* Figs. 1891 to 1894 are Designs which may be executed in mahogany the legs being supposed to be in the same style as those of the tables, and the seats to be covered with morocco of the same colour as the curtains. The seats are

1891



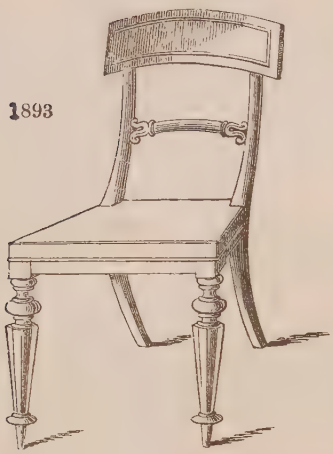
1892



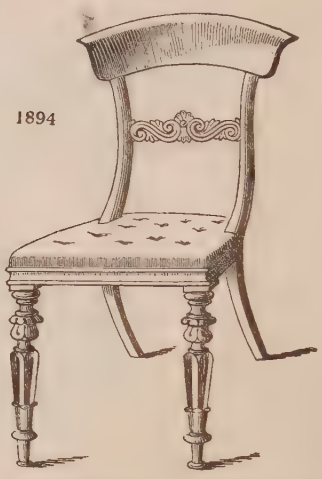
quilted, but, instead of tufts, small rings are used, covered with the same leather as the chair; these rings being found to look as well as, and wear better than, tufts of silk; at the same time that they do not harbour dust.

Fig. 1895 is a dining-room chair, with a stuffed back and seat covered with morocco and tufted. It is considered an easy and elegant seat.

1893



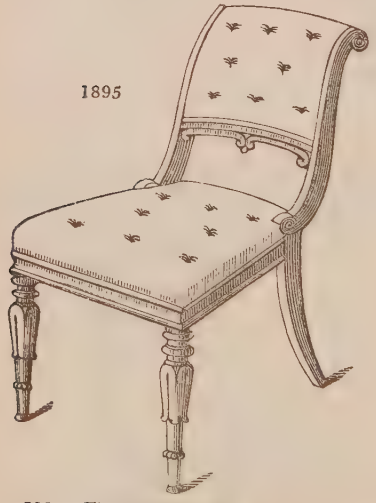
1894



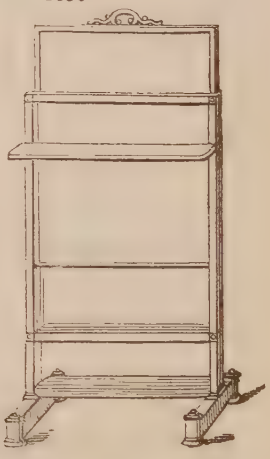
2087. *A Leg Rest*, fig. 1897, called an "ease and comfort," is sometimes used in dining-rooms by old gentlemen after the ladies are gone. It requires to be carefully stuffed, so as to fit the calves of the legs.

2088. *Candlestick Stands*, fig. 1898, are used in some dining-rooms to raise the candlesticks placed on the table, in order, by elevating the light, to throw it better over the dishes. Each of these stands has a raised rim round the top, to keep the candlestick it supports from falling off.

1895



1896



2089. *Fire-screens.* Fig. 1896 is a sliding fire-screen, which may be made of mahogany, oak, or deal. The frame has three slides; one draws up, and two draw out to the right and left. It should be covered with tammy (a sort of worsted stuff) or moreen, of the same colour as the curtains. It moves on castors, which are sunk into the feet.

1897

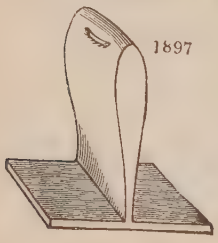
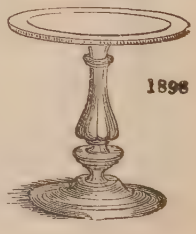


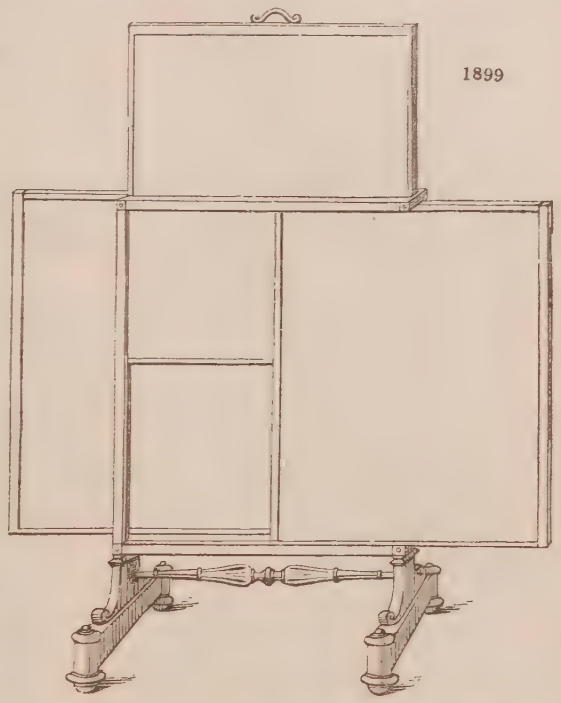
Fig. 1899 is a fire-screen with two swinging leaves, which fold out on each side, and, being hinged with

1898



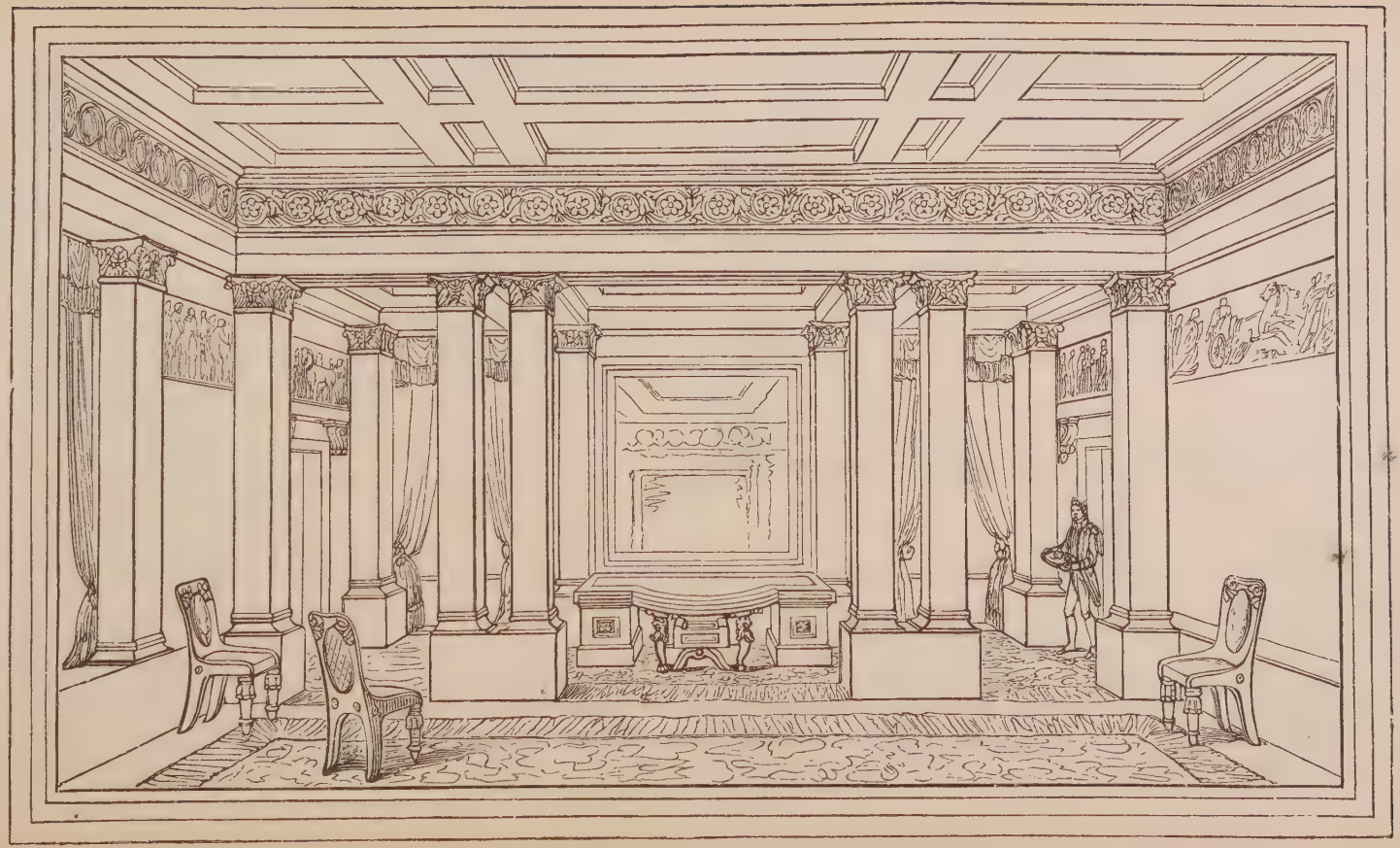
centre-point hinges, turn round either way. This screen is considered handsomer than the preceding one.

2090. *The Window Curtains* for the dining-room may be of the same patterns as those exhibited in figs. 705, 708, 710, and 711. The hangings should be of moreen, cloth, or some similar material, less delicate and ornamental than silk, chintz, &c.



1899

2091. *A General View* of the interior of a dining-room in the Grecian style, by Mr. Lamb, is shown in fig. 1900. In this Design, Mr. Lamb observes that "in the centre of one side there is a large pier glass over the sideboard, and a window in each side to the right and left. The servants' entrance to the room is opposite to the principal entrance, and communicates directly with the kitchen and other offices. Appropriate sculpture and arabesque ornaments are the principal decorations. The curtains are placed close to the windows, and within the pilasters, in order that, when drawn, they may not interfere with the Architecture of the room. — In taking a general view of the modern dining-room furniture here given, we shall commence with the sideboards and wine-coolers under them, which are, for the most part, very good. The idea of cooling wine in a sarcophagus, however disagreeable it may be to those who know the meaning of the word (flesh-devourer), and the original uses to which vessels of this shape were applied, is yet so sanctioned by modern habit, as to be, in our opinion, quite unobjectionable. There is no law in nature against the changing of the uses of objects; and the laws of society are, or ought to be, made by society for themselves, and not by past ages for those which are to succeed them. The dining tables, as we have already observed, are excellent; the legs, being all straight, are consequently all turned, and are ornamented in the same style, so as to produce unity of effect. The dining-table, fig. 1887, is a luxury, worth the attention of bachelors; but unworthy of any family who do not prefer wine to the rational conversation of women. Happily, in England, we are now borrowing a part of the very superior manners of the French, with regard to the dining-table. The circular table capable of enlargement, alluded to in § 2085, is an excellent article. All the dining-room chairs are more or less liable to the objections made to the hall chairs in § 2078; they are in other respects good, and we have no doubt would be sufficiently easy to sit upon. In the chairs seen in the interior, fig. 1900, there is just as much carving shown on the front legs relatively to the back ones, as there ought to be; perhaps, indeed, there is too much, but some allowance must be made for the facilities afforded by turning for bestowing ornament. In the chairs designed by Mr. Hope, and published in his great work, there will not be found any great difference between the ornaments on the front, and those on the back legs; and in the chairs in the Elizabethan style, where both the front and back legs were generally turned, the ornaments on them were exactly alike. Let the reader, if he has access to Flaxman's *Eschylus*, examine the chairs in that work. The fire-screens are good, and the candlestick stand, fig. 1898, convenient, where lamps are not used. The furniture in Mr. Lamb's interior is original, and yet classical; that is, it abounds in forms belonging to, or associated with, the antique.

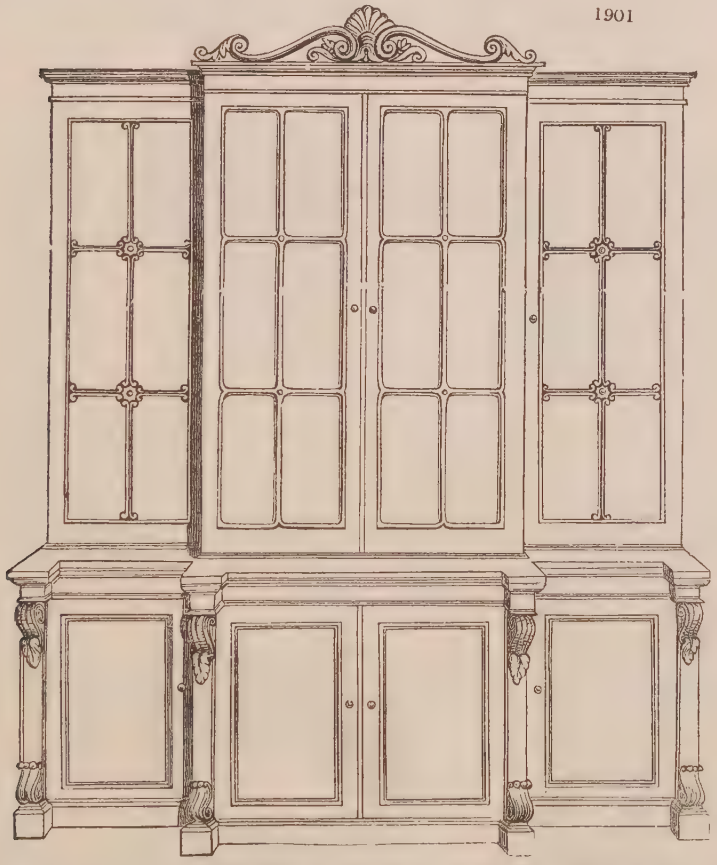


SUBSECT. 4. *Grecian and Modern Furniture for the Library.*

2092. *Libraries* on a large scale, and which are really intended to contain a collection of books, are fitted up with fixed book-shelves, occupying every part of the sides of the room, except the doors, the windows, and the fireplaces. If the books are enclosed by doors, the panels are commonly filled in with brass wire. An architectural character should always be given to the bookcases of a large library, corresponding with the style of the house. In small libraries, where the collection of books is not numerous, portable bookcases are resorted to; and it may be observed of them, in general, that they ought to be comparatively simple, and grave in expression. Panels of looking-glass in the doors or styles of bookcases are, for this reason, in our opinion, always objectionable; as there seems to be a want of harmony between looking-glasses, excess of carving, arabesques, and such finery, and the solid treasures of knowledge contained in the books enclosed.

2093. *Bookcases.* Fig. 1901 is a bookcase, the front of which breaks forward (projects). There are four doors below, the panels of which are wood; and four doors in

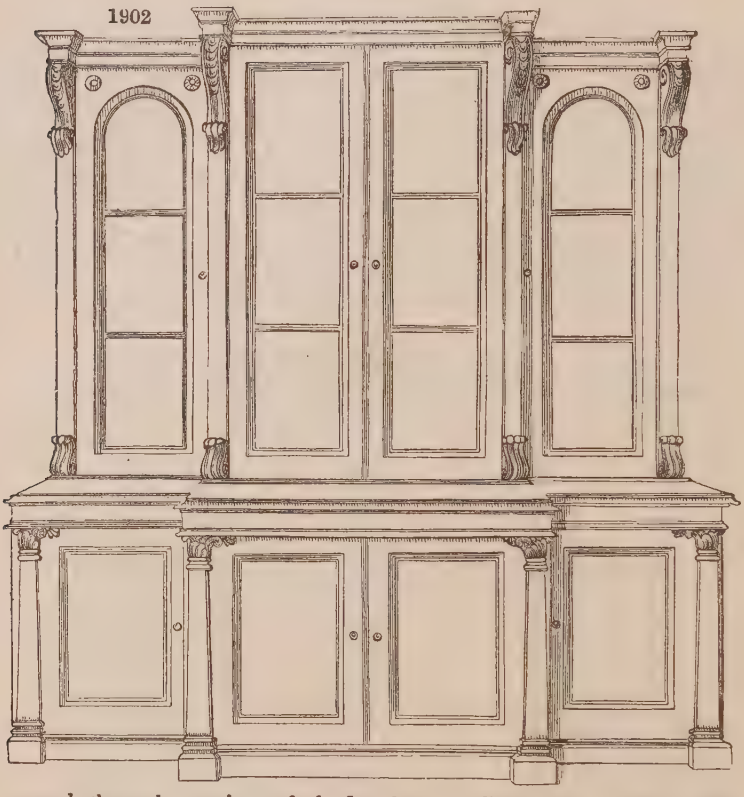
1901



the upper part, glazed with plate glass. There is a carved pediment in the centre of the top. The doors may either be plain, like those in the centre; or with ornaments, like those on the outsides, which are introduced to enable the reader to make a choice between them.

Fig. 1902 is a bookcase having the lower part finished with pilasters, or carved capitals; and having what are called carved trusses (projections serving, either really or apparently, as supports) to the upper doors. The panels of the lower doors are of wood; and those of the upper of plate glass, or of flatted crown glass. (Flatted crown glass is produced by heating the glass quite hot in an oven, on a flat iron plate laid perfectly level, to which the heated glass adapts its surface; the operation is performed for the cabinet manufac-

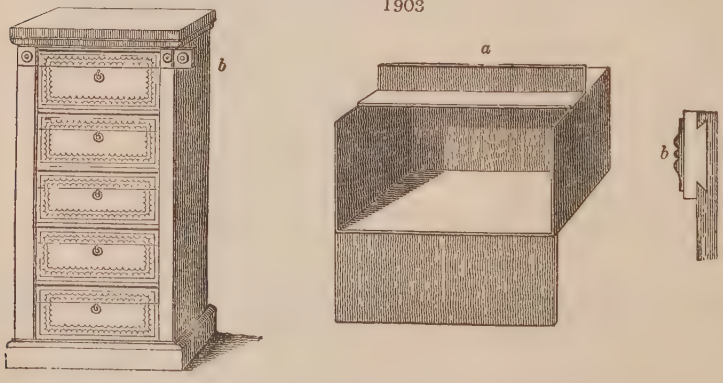
1902



turers, and others who require perfectly flat glass, by a distinct class of artisans, called glass annealers.)

2094. *A Pedestal Case, for holding Papers and other Articles.* Fig. 1903 is formed of mahogany outside, and encloses five boxes, which are made of pasteboard and covered

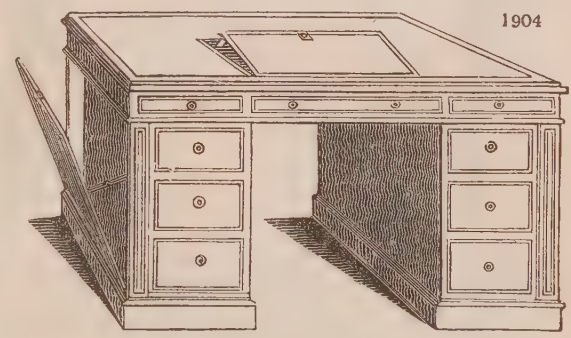
1903



with leather. Every box, *a*, takes out, and its top lifts up, which allows its front to fall down, and its contents to be examined. There is a small ring in the front of each box, to pull it out if required; but it is not necessary to pull any box out its whole length, in order to open it sufficiently to let down its front. The right-hand pilaster of the pedestal

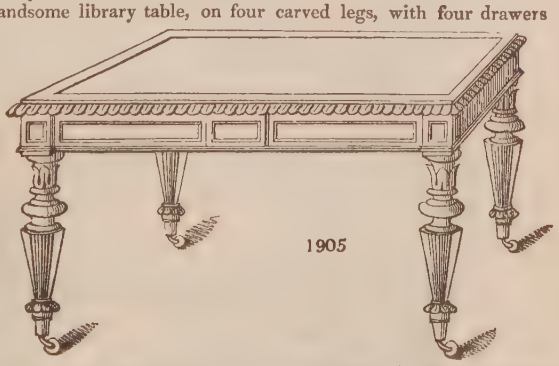
is hinged at the side, and locks at the top; the keyhole being covered by the patera, *b*, which slides over it in a dovetailed groove. By this means, all the boxes are secured by one lock, and they may be all opened instantly. There may be spaces left for labels in the front of each box if required, and the top may be made to rise up with a horse, like the desk, fig. 1904, so as to serve for reading on. The top is lined with embossed leather, of the same colour as that of the cases. Castors may be concealed in the plinth. This is considered a very useful piece of furniture for keeping select papers.

2095. *Library Tables.* Fig. 1904 is a pedestal library table, which may have drawers on both sides; or doors and cupboards on one side, and drawers on the other. There is a rising flap on the top, which may be raised to any height, to write or read upon; and, when not required, it can be let down flush with the top of the table. The ends are hinged at the bottom, and fold outwards; remaining open in consequence of being supported by a joint stay near the bottom. This forms a very convenient place for portfolios, or large drawings. The depth of the recess may be varied according to the width of the pilasters. The top is covered with embossed russia leather. For the private room of an Architect, such a table may have a drawer immediately under the top, of the same length and breadth as the table; and of five or six inches in depth, for the purpose of holding large drawing-boards with drawings on them, T squares, &c. In this drawer, the drawing in progress is kept completely from the dust; while the sightliness of the room is preserved, at times when drawing is not going forward. A rising portable desk, with double horse and rack, may be placed on the table, and raised to any convenient height for reading, writing, or drawing on, in a standing position, instead of the sinking fixed desk shown in the figure; or a false bottom may be made to the drawer, on which the drawing-board and all the drawing materials may be placed, in such a manner as that, when the drawer is pulled out, and the false bottom is raised to the required height by a rack and horse, the artist may go to work without any previous preparation, or arrangement of his instruments or materials; and he may leave off, lower down the false bottom and its contents, and shut up the drawer, in an instant.



1904

Fig. 1905 is a very handsome library table, on four carved legs, with four drawers and a carved moulded edge. The drawers pull out from under the rail, thus rendering knobs unnecessary, and maintaining an architectural character.

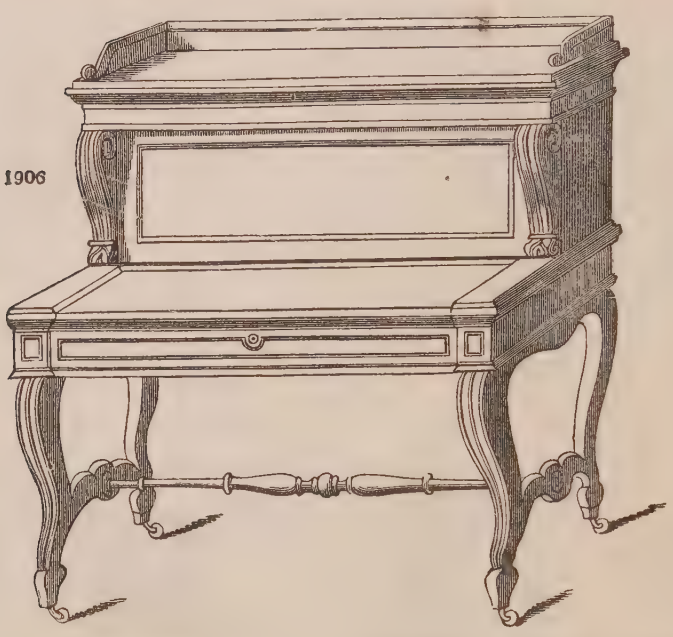


1905

2096. *Writing-Tables, or Secretaries.* Figs. 1906, 1907 represent a handsome writing-table, with numerous drawers and divisions for containing papers, money, &c.; and having on the top a shelf for books. The mechanism is such, that, notwithstanding its apparent intricacy, it can be opened and its contents displayed, or shut up and locked, in an instant.

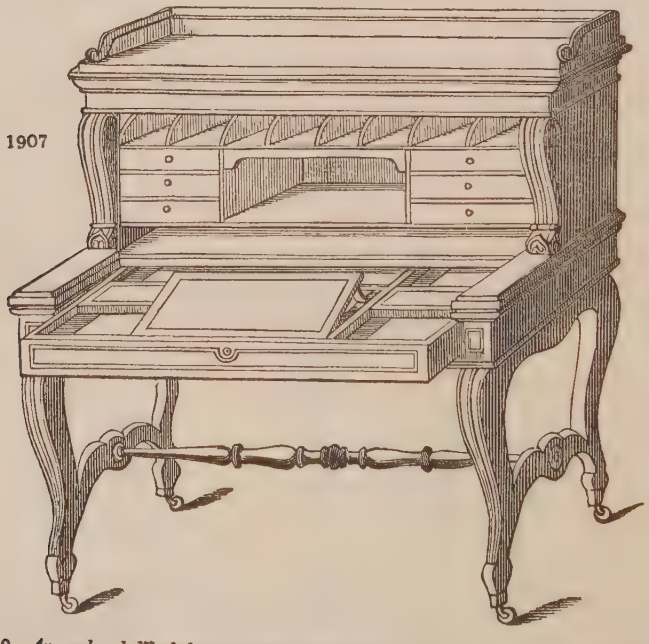
2097. *A sloping Writing-Desk*, such as fig. 1908, to a scale of one inch to a foot, is frequently used for placing on a library table. A part of the top is made flat, with a small lid which turns up, and displays inside the inkbottles, pens, wafers, &c. When not in use, the flap turns down, to keep every thing clean. The sloping part may be covered with embossed leather.

1906



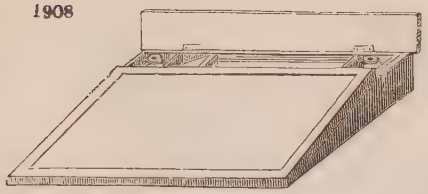
2098. *A Reading-Desk.* Fig. 1909, to the same scale, is a small rising reading-desk, which stands flat on a table, and occupies but little space.

1907



2099. *An enclosed Wash-hand Stand,* such as fig. 1910, to a scale of half an inch to a foot, is commonly placed in a library closet, or in a gentleman's study or business room.

1908



1909

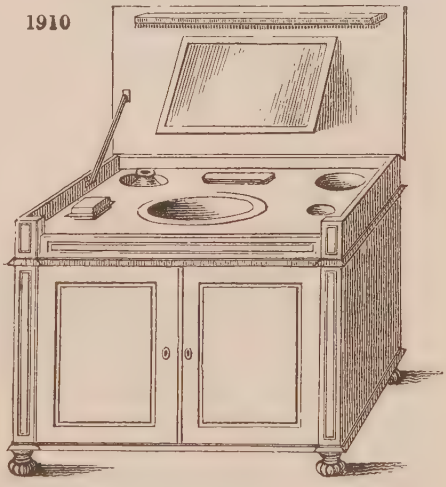
There is a slip of wood fixed on the under side of the top, which drops down in front, and completes the panel; thus shutting the whole up close. A glass is fixed on the under side of the cover, which rises with a rack and horse. There are two doors below, in the inside of which are shelves, and a space for keeping the ewer with the water; or it may be fitted up with any appropriate convenience that may be desired.

2100. *Chairs.* Figs. 1911 and 1912 are two easy reclining chairs for a library, parlour, or other sitting-room. They are covered with morocco leather, with button tufts; and they are very easy to sit upon.

Fig. 1913 is a view of Dawe's reclining chair for an invalid: the position of the back of this chair can be varied at pleasure, and the projecting part in front can be elongated, or adjusted to any slope. When it is not wanted to be used as a reclining chair, the back can be fixed upright; and the front projection slid in, so as to produce the appearance of a common easy chair.

2101. *Library Glass.* Fig. 1914 is a library chimney-glass, the frame of which may be made of mahogany or maple wood, or of deal gilt or bronzed. A plinth for it to stand on, half an inch in thickness, of ebony, ought to be added; not only for effect, but to prevent the gilding or bronzing of the frame from being injured by washing the mantel-shelf. We may observe here, that it is a common and commendable practice, when housemaids are dusting the walls of rooms, to have a narrow slip of thin deal in one hand to place against the edges of the mouldings to prevent them from being rubbed.

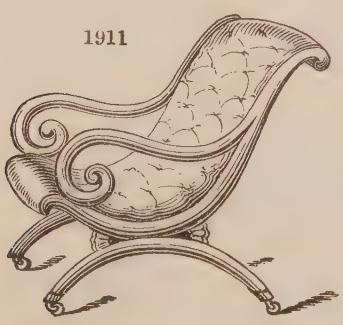
1910



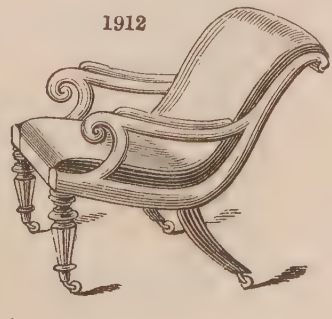
2102. *The Window Curtains of a Library* may be formed of the same shapes and materials as those recommended for the dining-room, § 2090.

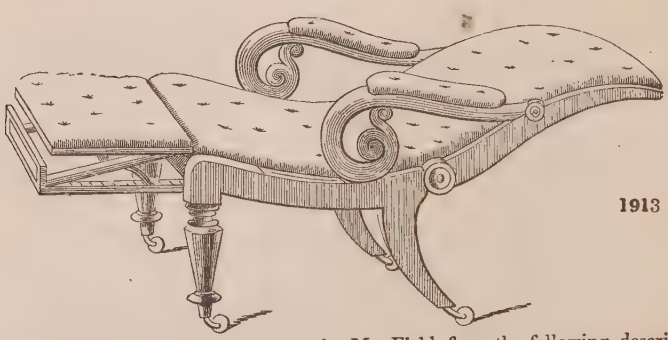
2103. *The general Appearance* of a library fitted up with a continued range of bookshelves is so simple as not to require delineation in a work like the present. A very

1911



1912





1913

chaste design for such a library was sent us by Mr. Field, from the following description of which, by that gentleman, any young Architect may embody it in light and shade: —

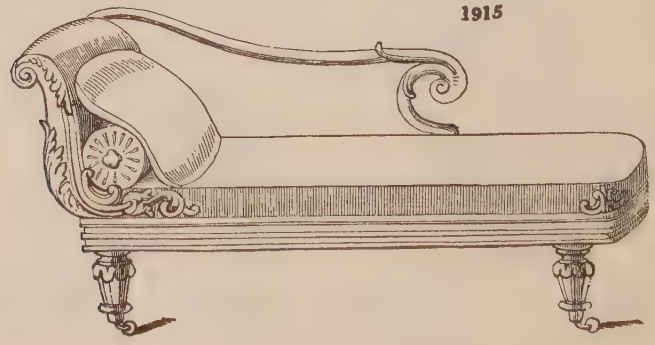
"The dimensions of this room are about thirty feet by eighteen feet, and it is thirteen feet high. The ceiling is surrounded by a large cove, intersected by arches over the divisions of the book-shelves, five in number lengthwise, and three breadthwise, of the apartment. The walls are entirely covered with shelves, except where the entrance door is shown in the centre of one end of the room, and where there are spaces for two or three windows, corresponding with the recess for the door, on the side opposite to the fireplace. The pilasters and entablature may be executed in scagliola marble, and the cove and ceiling may be coloured a light tint, to contrast with the pilasters and the graining of the woodwork. The books are secured by brass lattice doors. If a sky-light in the ceiling were introduced in lieu of windows, the uniformity of the Design, and the capacity of the library, would be increased."

1914

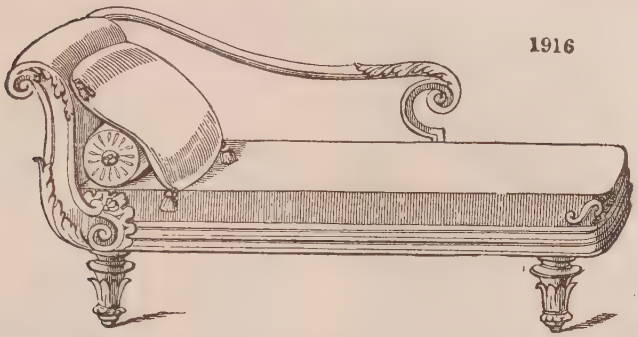
Subsect. 5. *Grecian and Modern Furniture for the Drawingroom and Music-Room.*

2104. *Couches.* Figs. 1915 and 1916 are two Designs for couches. In the second, the castors are sunk in the legs; and to each there is a loose squab (a sort of mattress

1915



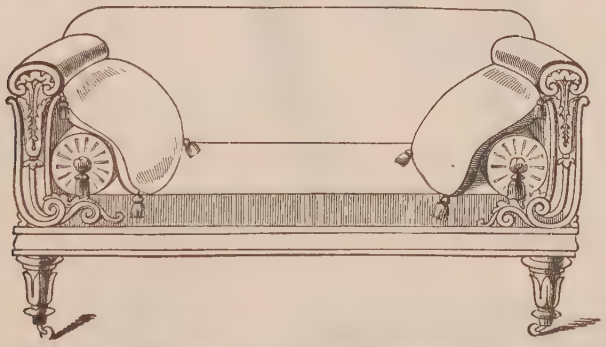
1916



serving as a seat) and bolster of hair, and a pillow filled with down. These couches we consider as handsome articles. The four feet, being all straight, are equally carved and ornamented. The carved foliage, embracing the frame of the head, and the hand-rail at the back, exhibits a happy specimen of the application of ornament, in such a manner as to make it appear as if it arose out of the construction of the article; the curvature of the frame of the head is of itself highly beautiful, being a modification of the Greek cyma (wave), the most elegant and graceful of all curves; and, as Mr. Hosking has happily shown, identical with Hogarth's serpentine line of beauty. Couches in small rooms are generally preferred to sofas.

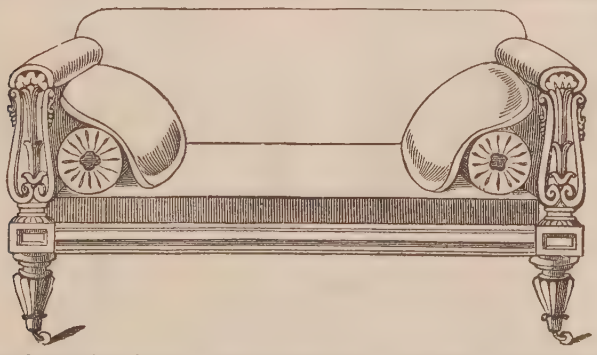
2105. *Sofas.* Figs. 1917 and 1918 are two Designs for sofas; the ends of which, if desirable, might be made of a similar pattern to those of the preceding couches. The

1917

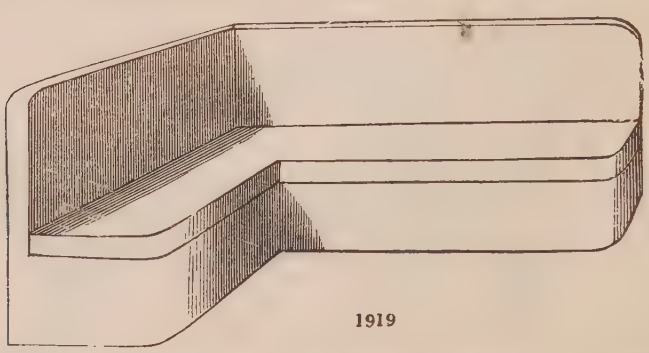


coverings and finishings of couches and sofas should harmonise, in colour and material, with the window curtains. The framework of these sofas we consider elegant; the

1918



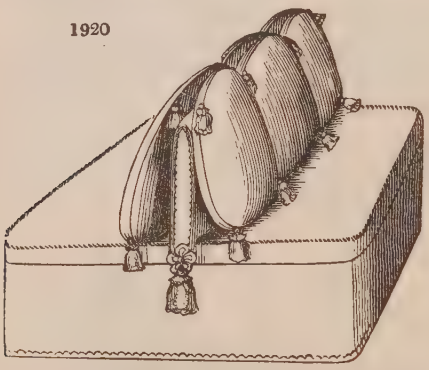
ornaments harmonise with the arms on which they are placed, and with one another the general outlines and forms are simple, and the details rich.



1919

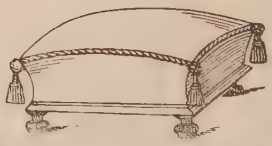
2106. *Ottomans* are stuffed seats for several persons to sit on at once; they may be placed either against the walls of a room, or in the open floor. Fig. 1919 is an ottoman for

1920



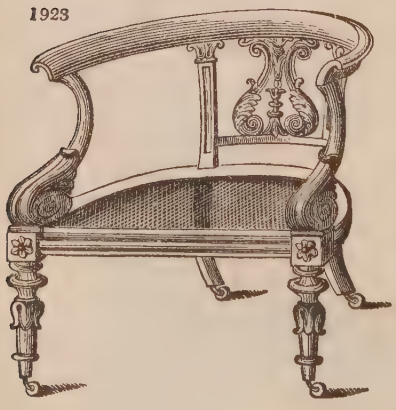
1921

1922

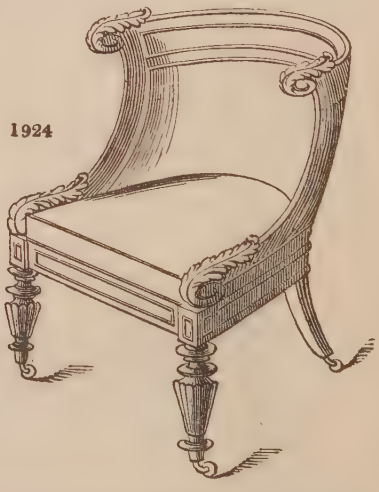


the corner of a small room; and fig. 1920 is another for the centre of a room of considerable size. The back in the centre is fixed; the seats are stuffed on a wooden frame, and

1923



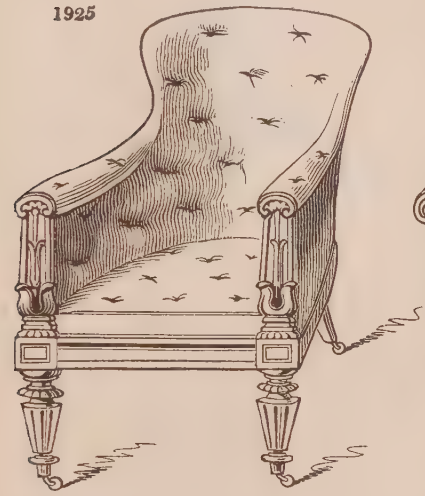
1924



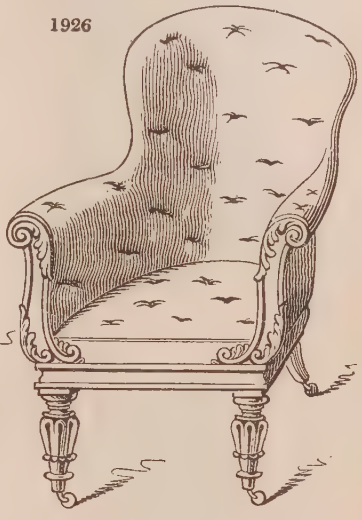
take off, leaving a well or cupboard beneath, for holding the loose linen cases by which they are covered, when the drawingroom is not in use.

2107. *Ottoman Footstools.* Figs. 1921 and 1922 are ottoman footstools, which may have the same-coloured coverings as the ottomans, or as the curtains; the material being fine cloth. The carved part may be of mahogany or rosewood.

1925



1926

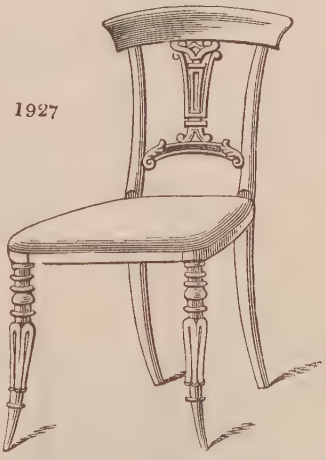


2108. *Chairs.* Figs. 1924, 1925, 1926 exhibit three varieties of easy chairs. They may be covered with morocco, or with the same furniture as the sofas and window curtains.

Fig. 1923 is another easy chair, with a richly carved frame, and cane seat. It should have a cushion covered with the same stuff as the curtains. These chairs are all to a scale of three quarters of an inch to a foot.

Fig. 1927 may be made of maple, or any other veined wood; or of beech painted or japanned. The variety of chairs of this kind is endless; they are not very strong, but their appearance is light, and, their proportions being slender, they may be considered as not inelegant.

1927

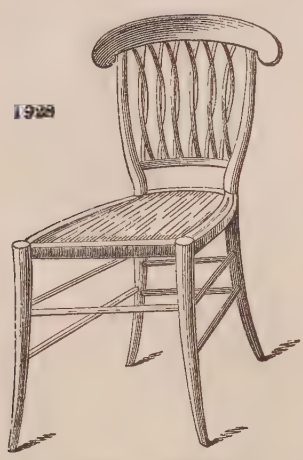


Figs. 1928 to 1932 are what are called fancy chairs for drawingrooms; they may be made of rosewood, maple, satin, or any other kind of fancy wood; and French polished (that is, polished and varnished with a particular composition invented in Paris, and brought to this country after the peace of 1814). The seats are first caned, and then covered in patterns with willow (split willow rods) of different colours, produced by staining, so as very successfully to imitate various kinds of wood. These chairs, when not so expensively finished in the seat, will also serve for bed-rooms. Their great advantage in a drawingroom is their lightness. They may have hair cushions covered with the same furniture as the curtains and sofas; or they may have stuffed seats covered with damask.

Figs. 1933, 1934, and 1935 are also drawingroom chairs. The first has a carved seat and back: the other two are made of maple or satin wood with matted seats. The splats (the middle part of the back, which either connects the top and bottom rails, or the two side styles) are carved in the forms of the rose, the shamrock, and the thistle.

Figs. 1936 and 1937 are drawingroom chairs. Fig. 1936 has an open back, which may be executed in rosewood or mahogany. Fig. 1937 has a stuffed back, and is a very easy chair to sit upon, though rather expensive. In point of taste, the chairs from

1928



1929

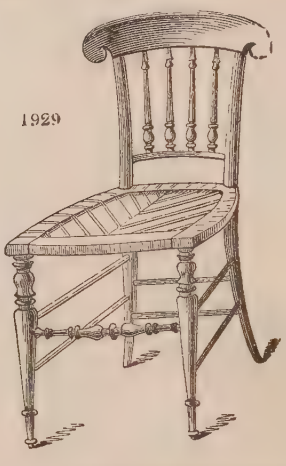
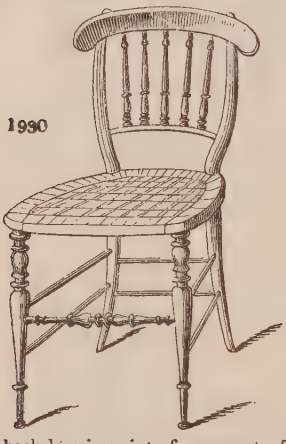


fig. 1923 to fig. 1927 are objectionable, on account of the difference between their front

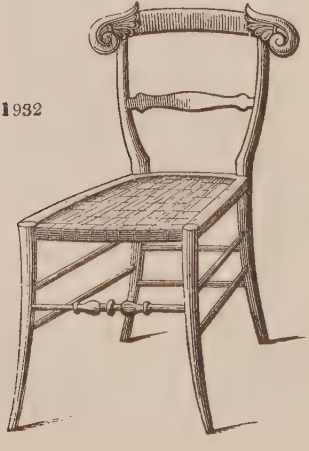
1930



1931

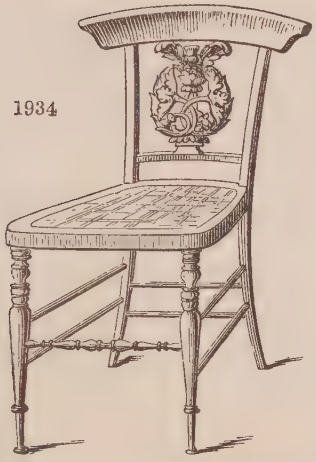
and back legs in point of ornament. The front legs, and supports of the back and arms,

1932



1933

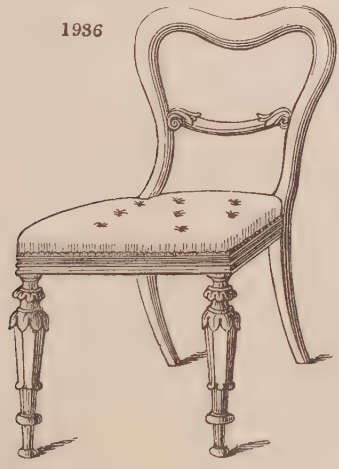
1934



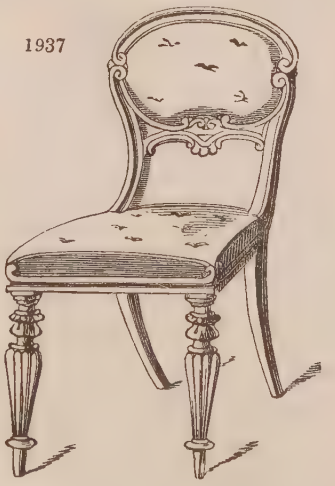
1935

of the Designs alluded to, are most richly ornamented, and the decorations in general are judiciously applied; that is, they appear as if they resulted from the construction; yet the hind legs are as bald as those of the hall chairs, or of any chair which could be constructed for the humblest cottage. A very little reflection will convince any one

1936



1937



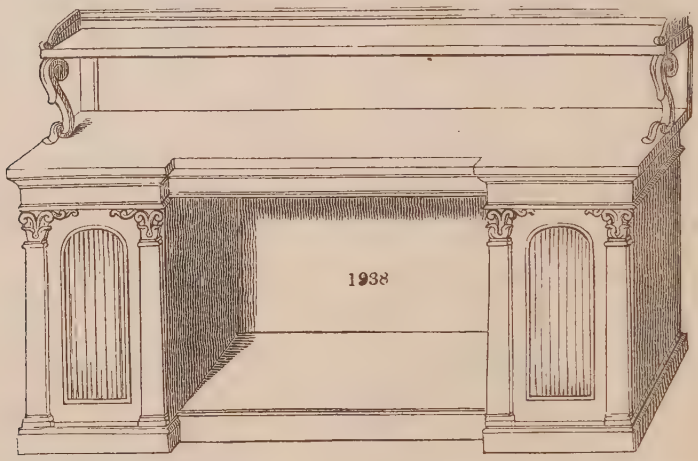
that this cannot be in good taste. The Designs, fig. 1928 to fig. 1935, do not show so great a discrepancy between the front legs and the back ones; and to us they are, on that account, much more satisfactory. There are none of these chairs, however, entirely to our mind; because there is scarcely one of them in which there is perfect harmony in the direction of the lines. Not one of these chairs can have been designed by an Architect, or other artist; they are much more like the efforts of a mechanic in search of novelty. Fig. 1937 is not bad, with the exception of the hind legs.

2109. *The Polishing of Chairs and other Furniture* is a matter which should not be lost sight of by a purchaser. In large towns, such as London and Edinburgh, where the art of polishing furniture forms a distinct occupation, what is called the French polish is by far the best for bringing out the beauties of the wood, and giving it a brightness and richness of colour which nothing else hitherto invented can produce. An important advantage of the French polish is, that it is not liable to crack or show scratches, like varnish. Wherever, therefore, the French mode of polishing is practised, we would recommend its adoption at least for all drawingroom furniture, and for the finer articles of libraries and dressing-rooms. For dining-tables, Mr. Dalziel states that by far the best polish for the tops is cold-drawn linseed oil alone, rubbing them

hard with any soft cloth for a period of several hours till they are got to a bright polish; which, when once obtained, can be kept up with little labour, and will stand hot dishes and boiling water better than the French or any other polish. The ordinary polish used by cabinet-makers consists of bees' wax mixed with spirits of turpentine and a small proportion of rosin. When this has been all dissolved together, the wood to be polished is thinly washed over with it, and it is immediately afterwards rubbed off by clean soft cloths. For polishing carved work, a clean soft brush must be used for laying it very thinly on, and another brush, in a very slight degree harder, must be employed for rubbing it off.

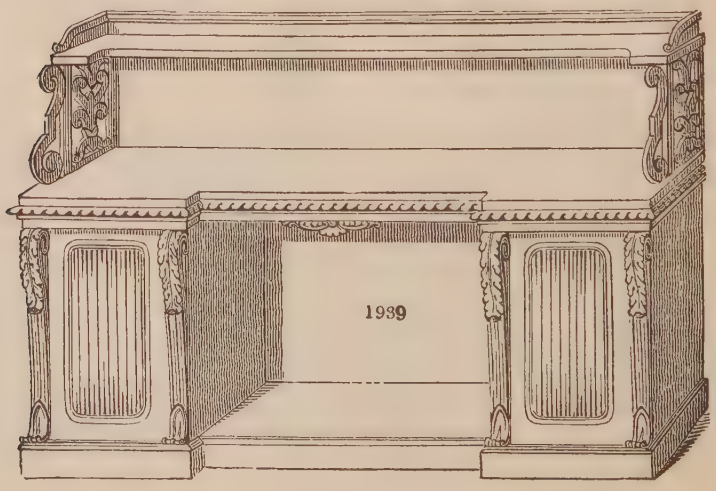
2110. *Consol Tables.* The term consol is applied from the form of the front leg or pillar by which such tables are usually supported, which is that of a carved ornament called a consol, frequently placed on the front of brackets, and on the keystones of arches.

Fig. 1938 is placed at the ends of drawingrooms, or against very broad piers between doors or windows. The panels in the back are of looking-glass; and the doors of the



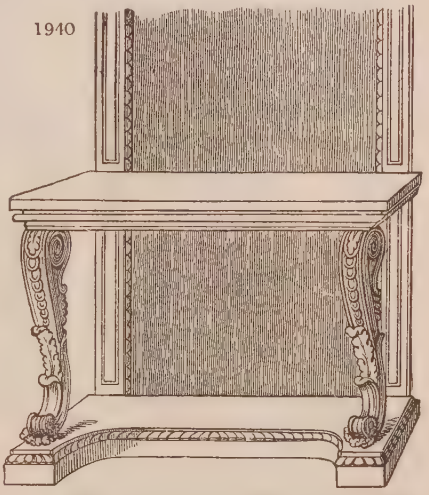
two pedestals have panels filled in with fluted silk, or looking-glass may be substituted. The tops of such tables are frequently formed of statuary marble, and the supports and upper shelf of the finest rosewood; sometimes the shelf is omitted. The looking-glass is sometimes carried up to the height of five or six feet. On the bottom board, in front of the lower glass, are placed vases for holding flowers, and a number of other ornaments.

Fig. 1939 is another table of the same description, but of a different pattern.



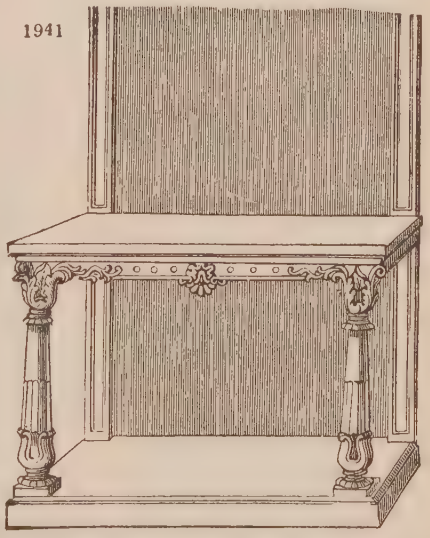
2111. *Pier Consol Tables.* Figs. 1940, 1941, 1943, 1944 exhibit four varieties of pier consol tables, with marble tops, and silvered plate-glass backs. They are commonly placed against the piers between windows. They are made of rosewood, and sometimes gilding is introduced on the carving, especially when the style of Louis XIV. is imitated, as in figs. 1943 and 1944. The looking-glasses are placed in gilt frames, and they are carried up nearly as high as the ceiling. The tops of these tables are sometimes covered with scagliola, instead of marble, which comes a great deal cheaper; and, when executed in Mr. Brown's very superior manner, looks nearly as well.

1940



2112. *Pier Tables with Marble Tops* may be supported by cast-iron brackets, or other stands of that metal, gilt or bronzed, at very moderate expense, and with excellent effect. We have already given various Designs for brackets, and for the ends of tables, to be formed of cast iron, from sketches by Mr. Mallet; and we might here add a number of others from the same fertile and tasteful contributor, but we think it unnecessary. Almost every thing in the style of Louis XIV. may be executed in cast iron cheaper than in wood. Pier and consol tables are great ornaments in drawingrooms, and ought never to be omitted where splendour is an object to be desired, and money is not wanting. One great advantage of them is, that the glasses which form a part of them multiply every object in the room, from the floor to the ceiling, and not only every object in the room, but the views of objects reflected from without; whereas chimney-glasses only reflect objects at a certain height between the floor and the ceiling.

1941

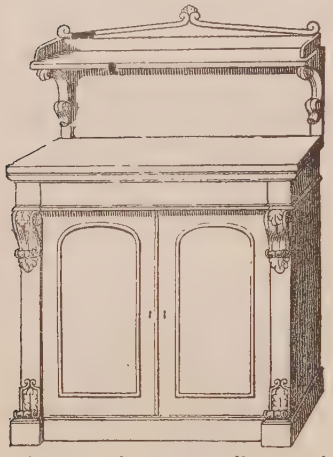


2113. *Chiffoniers.* Fig. 1942 is a chiffonier pier table for placing between windows. These tables are usually finished with white marble tops, with plate glass behind, and a shelf supported by brackets for holding ornaments. The panels of the doors may be silvered plate glass, or of fluted silk. These are most useful objects for families who cannot afford to go the expense of pier or consol tables. In parlours, and even lady's libraries, they may be used as a sort of morning sideboard for containing any light species of refreshment.

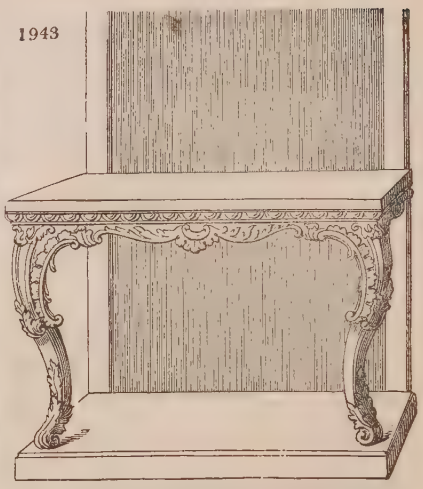
2114. *Devonports* (so called from the inventor's name) are drawingroom writing-cabinets used by ladies. Fig. 1945 is a very convenient piece of furniture of this description; the top part, forming the desk, pulls forward to come over the knees when it is to be used. A sliding flap draws out on each side, to hold papers, a candle, &c. The desk lid lifts up, and beneath it is a space for papers, and several small drawers. There is besides a drawer which pulls out at the side, and turns round, as shown in the figure, for pens, ink, wafers, &c. Beneath the flap are drawers on one side, and the other side is finished with the appearance of drawers to correspond. The back is handsomely paneled, so that each side of this piece of furniture looks well. The flaps and sides are lined with morocco leather embossed. There are castors concealed in the feet.

Fig. 1946 is a Devonport which stands on a plinth, having concealed castors, and

1942

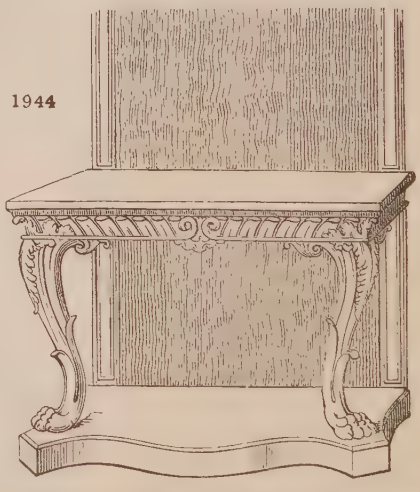


1943



which resembles the preceding one in every respect, except in being rather plainer These are very useful articles for industrious young ladies. We have seen some of them, and also of the articles in the two preceding and two following paragraphs, in Mr. Dalziel's show-room, of much more elaborate beauty, executed in the rarest exotic woods, and finished with French polish; but we have preferred giving these simple Designs, as likely to be more generally useful.

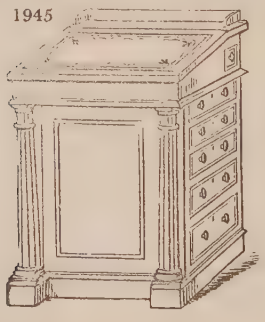
1944



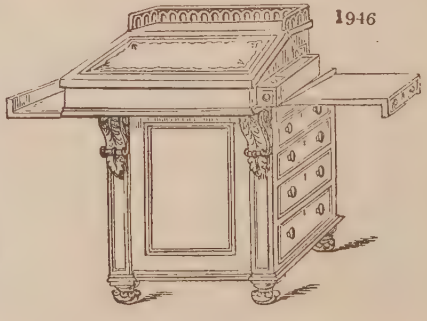
2115. *Lady's Work Tables.* Figs. 1947 and 1949 are fitted up with drawers for holding cottons; and they have bag frames, which are of wood, covered with fluted silk, and fringed at bottom for containing work.

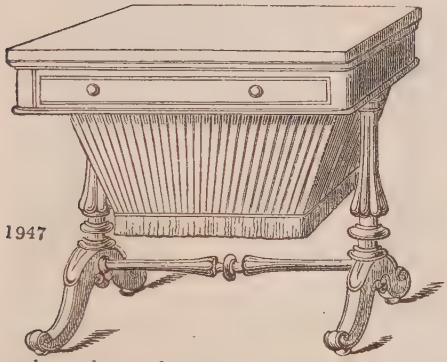
2116. *Sofa Tables.* Figs. 1948, 1950, 1951, and 1952 are four different varieties of sofa or occasional tables for drawingrooms. Drawers may be introduced under the tops; but the effect is not then so good, as it requires the upper part of the frame to be made deeper, and consequently gives the table too massive a character for an article of drawing-room furniture. In examining whether the tables, in this and the preceding paragraph,

1945



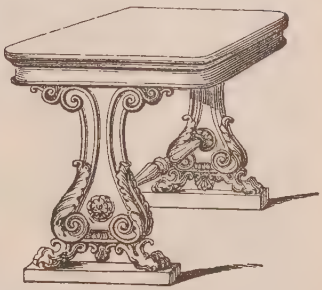
1946



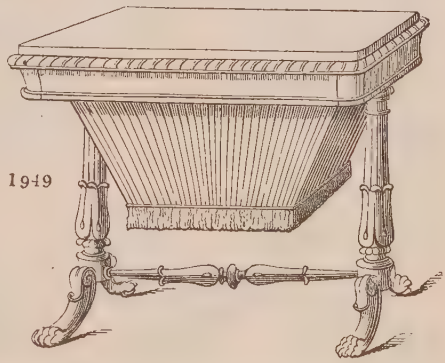


1947

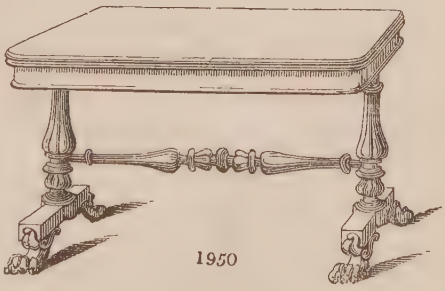
1948



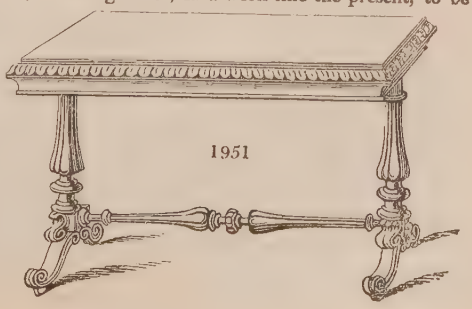
are in good taste, let us first see how far they display unity of style. In the legs and bottom rails this unity is conspicuous. Looking at the former apart from the latter, we should never expect to find the bottom rails joined to them, square in the section; neither should we expect cylindrical rails perfectly plain. The legs being turned and carved, the rails, to be in unison with them, ought to be turned and carved also; and, as they are so, they are therefore in good taste. The style of the supports of the table ought, of course, to give a general idea of the style of the top, and here we find that some of the tops, for example those of figs. 1949 and 1951, have carved mouldings round the edges, and therefore they harmonise with the legs and rails, and consequently may be considered in good taste; but the tables, fig. 1948, fig. 1950, and fig. 1952, though their legs are equally enriched with those of the other Designs, have plain mouldings on their edges; hence we have no hesitation in determining them to be in comparatively bad taste. The justness of this criticism will appear more obvious, by applying it to the table, fig. 1948, which has two supports more highly enriched by carving than those of any of the other figures, and yet has a plain top. This is in bad taste, and ought not, in a work like the present, to be passed over without notice. In order to show the utility of this kind of criticism, and of giving Designs which are less perfect than they might be made, let us suppose, for a moment, that we had only given the tables figs. 1949 and 1951, which we allow to be in tolerably good taste. All that we could have said of these tables is, that they were very good of their kind, displaying unity of style and of



1949

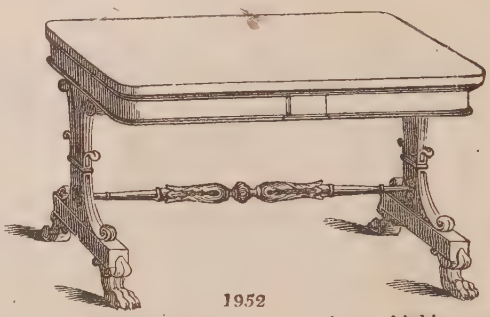


1950



1951

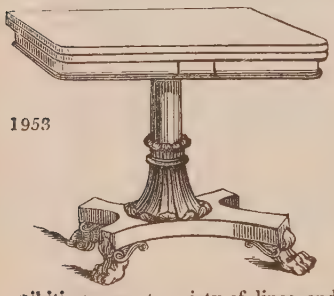
ornament; and, therefore, that they deserved the approbation of the reader. By introducing other tables, however, less perfect with regard to unity of style, we have an opportunity of contrasting the good and the bad; and of showing forcibly, in what the difference between these qualities consists. We think it the more desirable to do this, because these tables, both the good and the bad, are made in hundreds by the London cabinet-makers; and are purchased by their customers, without the latter thinking any thing about their unity of style.



1952

2117. *Card Tables.* Fig. 1953 is a card table with a carved pillar and a revolving top, the principle of which has been already explained, § 630.

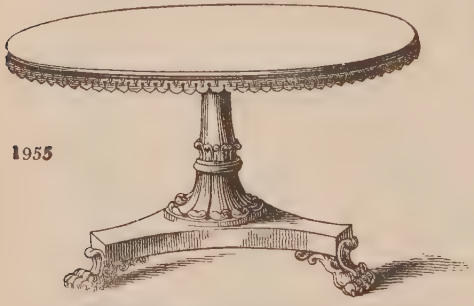
2118. *Loo Tables.* Figs. 1954 and 1955 are loo tables, which may be executed in rosewood, or in any other rare and handsome foreign wood. These tables, appear to us unobjectionable, in point of taste; the legs and bottom rails are of elegant forms, exhibiting a great variety of lines, and of light and shade, all in harmony among themselves, and not inconsistent with the tops.



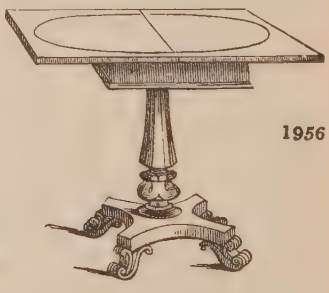
1953

1954

2119. *Ecarté Table.* Fig. 1956 is a table of this description, with the top open. The oval part is lined with cloth or velvet; the top revolves like that of a card table, and shuts up so as to form a small work table, when not wanted for playing on



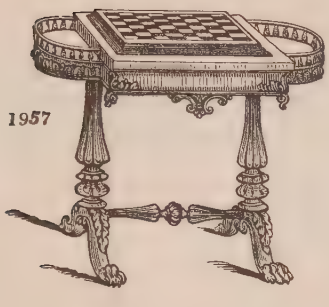
1955



1956

2120. *Chess Tables.* Figs. 1957 and 1958 are two different patterns of chess tables richly ornamented, and considered handsome. There is a semicircular compartment on each side, on which to place the chessmen, or lights; there is also a drawer to each table; and there are concealed castors in the legs.

2121. *Stands for Books.* Fig. 1960 is a pedestal stand for containing such books as may be considered ornamental in a drawingroom. There are shelves on all the four sides, and the angles are cut off by coves, as shown in the plan. On the top of the stand may be placed an elegant vase, with or without flowers; a globe of water containing gold-fishes; or a bust, or other object, according to the taste and pursuits of the lady of the house.


1957

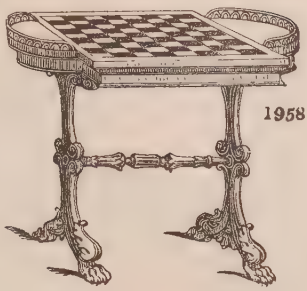
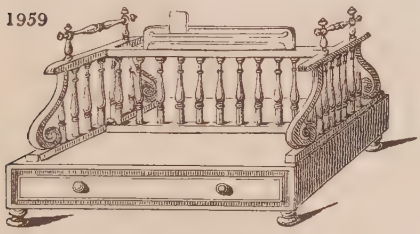
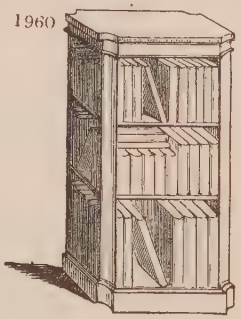
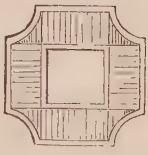

1958

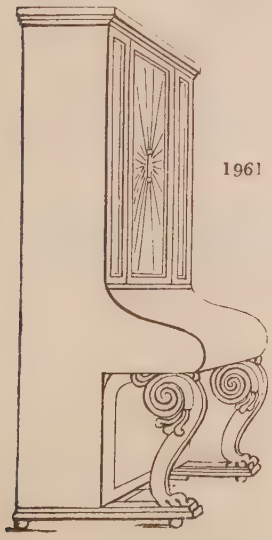
Fig. 1959, to a scale of one inch to a foot, is a bookstand to be placed on a table. There is a drawer for letters or other papers, and at top a rack for holding cards; and


1959

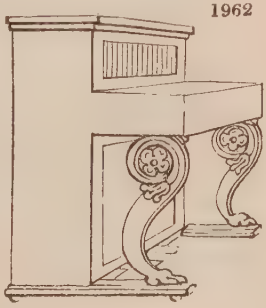

1960



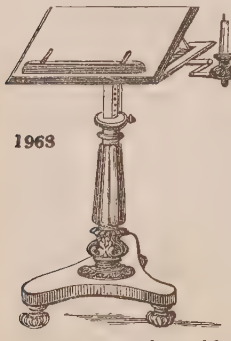
two handles, for removing the whole when necessary. Stands for books might be made in a great variety of forms, and, to those who derive great part of their happiness from reading, bookstands are always welcome pieces of furniture. "One of the grandest detached bookstands I ever saw," says an American correspondent, "was placed in the centre of a square library, with a lofty ceiling, lighted from the roof. It was in the form of a pyramid; the shelves rising above one another like the steps of a stair to the height of twelve feet; and each step, though narrow, was yet sufficiently broad to admit any person to walk up and walk down in order to take out or put in books. The whole was surmounted by a statue of Jefferson, and at the angles was a light mahogany handrail to assist in walking up and down. The artificial light was from gas, placed outside the skylight, and within an outer glass case. Underneath the pyramid was a pedestal filled with steam-pipes, for heating the room. The four sides of the room were fitted up with bookshelves to the height of twelve feet, with a travelling step-ladder, similar to one which I saw, when in England, in one of the London club-houses."


1961

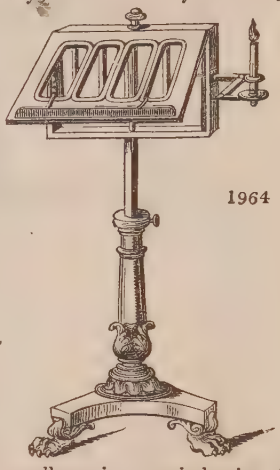
2122. *Piano-fortes.* The forms of piano-fortes have been lately much improved, so that they now harmonise with the general forms of drawing-room furniture better than they ever did before. The first step in the road to this desirable end was made by the manufacturer Stodart, who invented the upright and


1962

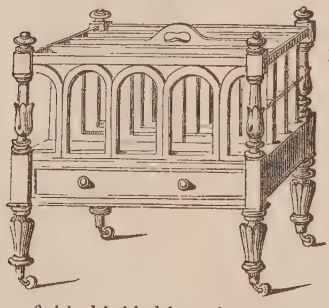
cabinet pianos about the beginning of the present century; and the last by Wornum, Store Street, London, in the year 1833. This last manufacturer, in that year, exhibited a piano-forte that could hardly be distinguished from a library table. The piano-fortes of this maker, which are most frequently used, are the two sizes, figs. 1961 and 1962: one of the smallest size, exhibited in fig. 1962, costs from thirty-six to fifty-five guineas; and one of the largest, shown in fig. 1963, costs from fifty to one hundred guineas. The first instrument is three feet four inches, and the second six feet six inches, in height. There are numerous other forms of piano-fortes and organs; and also of what are called harmonics, which produce music by machinery. The advantages of Wornum's instruments are, that, with the same degree of tone and excellence, in a musical point of view, as the horizontal pianos, and with the convenient form of the upright pianos, they



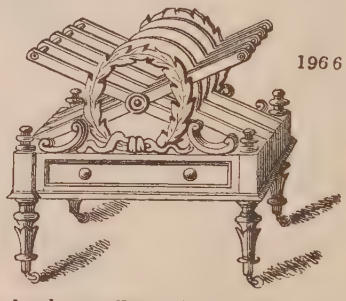
1963



1964

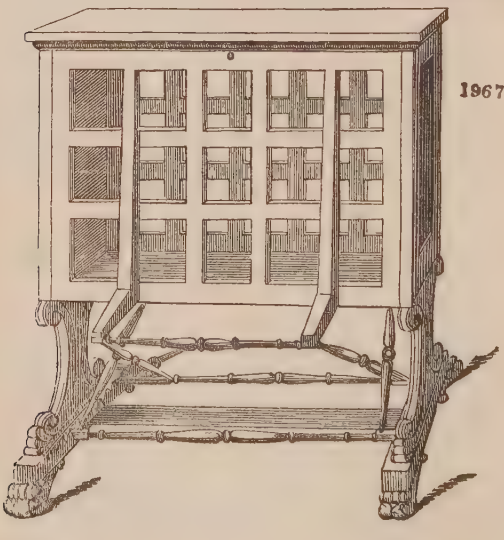


1965



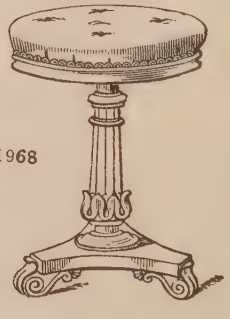
1966

are finished behind in such a manner as to have a handsome effect whichever side is presented to the company. The old upright and cabinet pianos were generally placed against walls.



1967

2123. *Music-stands.* Fig. 1963 is a stand for holding music-books. The upper part rises out of the pillar to any convenient height;



1968

and the pillar of support is round in the upper part, so as to change the position of the desk at pleasure.

Fig. 1964 is another music-stand, the desk of which also rises out of the pillar. The top, when not wanted for music, folds down quite flat, and forms a small table.

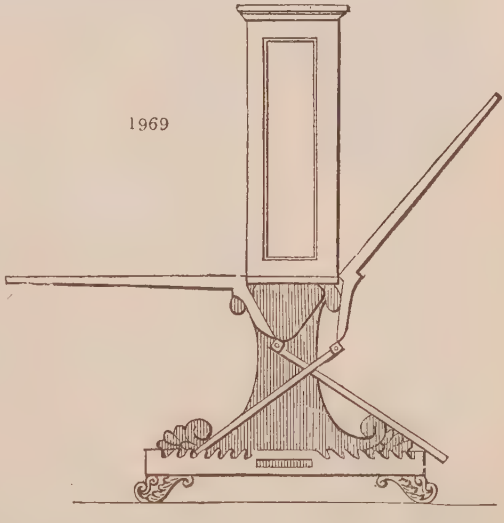
Fig. 1965, to a scale of three quarters of an inch to a foot, is what is called a music Canterbury. Its use is to hold music-books; and, as may be seen in the figure, the feet have castors for moving it about at pleasure.

Fig. 1966 is another music Canterbury, of an elegant but rather expensive construction. Musical instruments being, in all cases, articles of luxury, ought never to be made otherwise than ornamental. For this reason, not only the most beautiful forms ought to be employed, but rare and curious woods, shown off to the best advantage by French polish. Brass candlesticks, and other brass ornaments attached to them, we, for our own particular taste, would avoid, and either use plated steel, or bronze; possibly ivory or ebony might, in some cases, be partially or wholly substituted for brass or any other metal.

2124. *Music-Stool.* Fig. 1968 is a music-stool, pillow-stuffed. It rises from the stand by turning round the top, which raises a male screw contained in the female one formed in the pillar. The screw is commonly made of wood; but iron is preferable, as working better, and lasting longer.

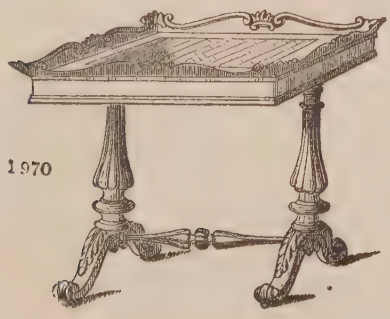
2125. *Portfolio-stands* are useful pieces of furniture both in libraries and in drawing-rooms. Fig. 1967 is a view of a stand for portfolios, or large prints, in which the portfolios can be conveniently locked up when the family are from home. The two fronts fall down to any degree at pleasure, till they both become level, as shown in the section, fig. 1969, and thus admit of easily examining the prints or drawings. Articles of this description are usually made without the ends, and with the two framed sides; but by this plan the portfolios have to be taken out before they can be opened, and, besides, they cannot be locked up.

1969



2126. *Flower-stands.* Fig. 1970 is a kind of flower-stand, which is commonly called a jardinière. A tin pan fits into the top, which has a cover of trelliswork, or of pierced tin, through which cut flowers are put into wet sand. A loose top of rosewood is made to fit into the recess which contains the tin pan, to be put in when the stand is not wanted for flowers, in order to render it useful as a small table. Prince Pückler-Muskau mentions a flower-

1970



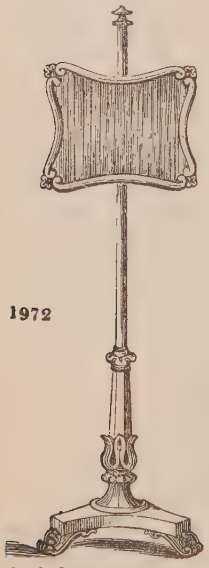
1971

stand, in which the tray is placed in the bottom of a drawer which slides in under a plate-glass top, which may be used as a writing or work table; and, when the fragrance of the flowers is desired as well as their sight, it is only necessary to pull the drawer out a little. The prince expatiates on the luxury of a lady sitting at work by the table, looking through the glass at the flowers, and now and then pulling out the drawer to enjoy their fragrance. We hardly know whether this half-radical prince is in jest or earnest when talking in this manner; but we must say, for our own part, that we think the idea much more suitable for the diseased feeling of pampered luxury than for healthy active intelligent women. The woman who cultivates her own flower-garden, and watches the progress of vegetation in it from day to day, has every chance of receiving far more enjoyment from flowers than she who has them reared and gathered for her, and sees them for the first time through a plate glass.

Fig. 1971 is another Design for a flower-stand, the top part being of a circular shape.

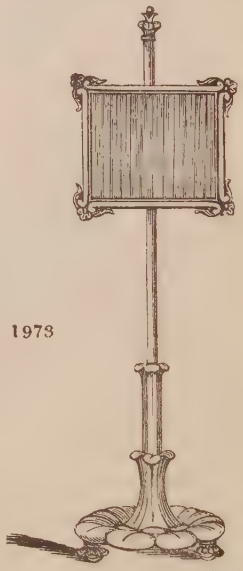
2127. *Candelabra* are isolated supports for lights. They are formed of wood or bronze, with three feet, and an upright pole, carved and ornamented, and terminating in a capital, on the flat top of which a lamp is placed. Sometimes, instead of terminating in a capital with a flap top, the candelabrum ends in branches for candles. Some of the handsomest lamp candelabra in present use are the scagliola columns manufactured by Mr. Browne of University Street, London. The cost of these candelabra is seven guineas each.

2128. *Fire-Screens.* Figs. 1972, 1973, and 1974 are Designs for drawingroom fire-screens. The poles may be of brass; as wood, and especially rosewood, is apt to warp or break.



1972

Fig. 1973 is a fire-screen with one slide, and a stuffed flat rail at bottom for the feet. There is a flap for holding a candle supported by a bracket. The fluting is of silk, of the same colour as that of the other furniture in the room. A fire-screen is an article of furniture almost exclusively British, because Britain is the principal country in Europe where open fireplaces formed, till lately, almost the only mode of heating the rooms of the wealthy classes. At present fire-screens are less in repute than formerly, because they are rendered less necessary by the improved modes of heating used in connection with open fires, which, by raising an equal temperature in every part of the room, lessen the inducement for the company in the room to collect round the fire. Instead of filling in the screen part of this piece of furniture with fluted silk, a picture is frequently introduced; sometimes a map, and at other times some curious performance of the needle. Large fire-screens for parlours are frequently covered with odd prints, and especially portraits of men, animals, plants,&c., and even with select passages from newspapers; or with conundrums, riddles, enigmas, and charades. For a large library fire-screen, nothing could be more appropriate than good maps; and, indeed, we have seen a globe raised on a pole, and sliding up and down it at pleasure, used as a small fire-screen. It is a great advantage for young persons to have frequently put in their way, such instruments of education, as globes, maps, chronological tables, tables of the heights of mountains, the lengths of rivers, &c.; for in this manner the contents of these instruments, insensibly, and without effort, impress themselves on the mind. A material is sometimes used for filling in fire-screens in some of the great houses in England, which would not at first sight occur as eligible: this is glass, through which the fire is seen, but through which it is found that the heat of the fire will not penetrate. This opticians account for, from the



1973

1974

circumstance of the spectrum being imperfect, and in a great measure deficient in the calorific rays. Sometimes the glass is stained to represent a painting, like the stained glass in church windows; and in this case the effect is remarkably rich and grand. Such a material is particularly suitable for filling in screens in the Gothic style; and those who are acquainted with the stained glass windows of our ancient cathedrals will readily conceive the endless source of variety and interest that might be added to this description of firescreen. In all rooms where there is a great quantity of furniture, and a great number of objects, it may be allowable, occasionally, to introduce one or two of a subordinate description as articles of curiosity, and which, like all other articles of curiosity, do not come within the pale of regular criticism. On this principle, Chinese and Indian firescreens are allowable, even though there should be no other article of furniture in the same style in the room.

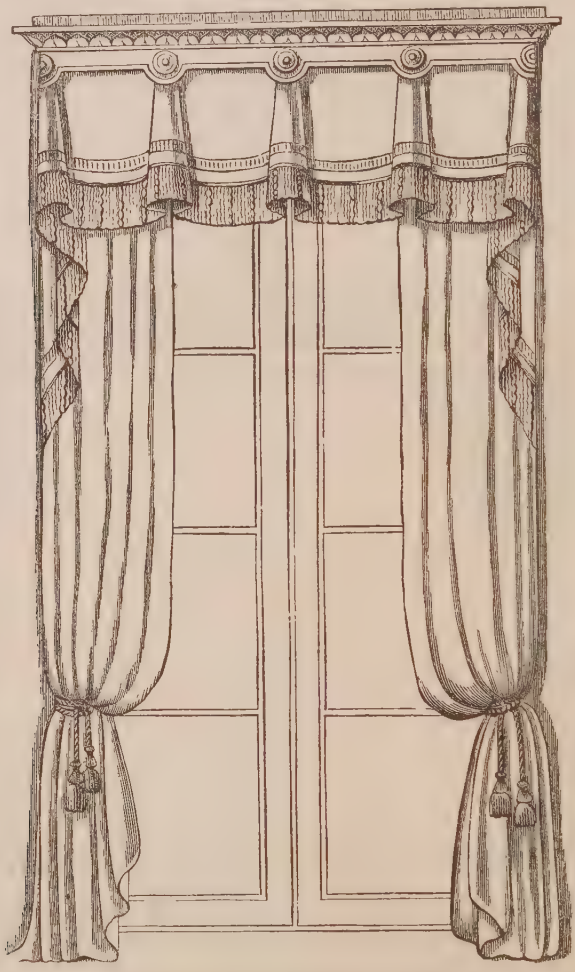
2129. *Chimney-glass.* Fig. 1975 is a Design for a Grecian chimney-glass, the beauty of which will depend much on the carving. Chimney and pier glasses should correspond

in the style of their frames, with that of the room in which they are placed. A pier-glass placed opposite the chimney-glass always has an excellent effect, as they reflect one another; so that the size of the room is doubled from whichever end the spectator directs his view. A black ebony plinth, French polished, is preferred to a gilded one, on account of its not tarnishing with the cleaning of the mantel-shelf. This plinth need not be above an inch and a half deep. Chimney and pier glasses, being comparatively fixtures, and belonging more to the permanent or constructive Architecture of the room, than to the furniture, ought, in our opinion, to be treated in a different manner from what they generally are. Their frames ought to be plainer, and more architectural; and rather to harmonise with the architraves of the doors and windows, and the marble of the chimney-pieces, than, as they now do, chiefly with the gilt frames of the pictures. A marble frame for a glass, such as Mr. Robison has introduced in his drawingroom, fig. 1817, we think in good taste; not only over a marble chimney-piece, but over a marble-topped pier or consol table. Perhaps there is no piece of furniture, put up by the London upholsterers, which is more generally in bad taste than looking-glasses; and this arises, as it appears to us, from that fertile source of bad taste in articles formed for those who have abundant wealth, — an excessive love of ornament. In this department of furniture, as in some others, we are certainly far excelled by both the French and Germans. We should say, let small, and especially portable, looking-glasses have highly enriched frames; but let those for large

plates, to be placed against walls, always be simple and architectural, seeming to belong to the construction of the room.

2130. *Window Curtains.* Fig. 1976 shows a window curtain with a gilt cornice and handsome drapery, the hangings being either of damask or chintz, with bullion fringe

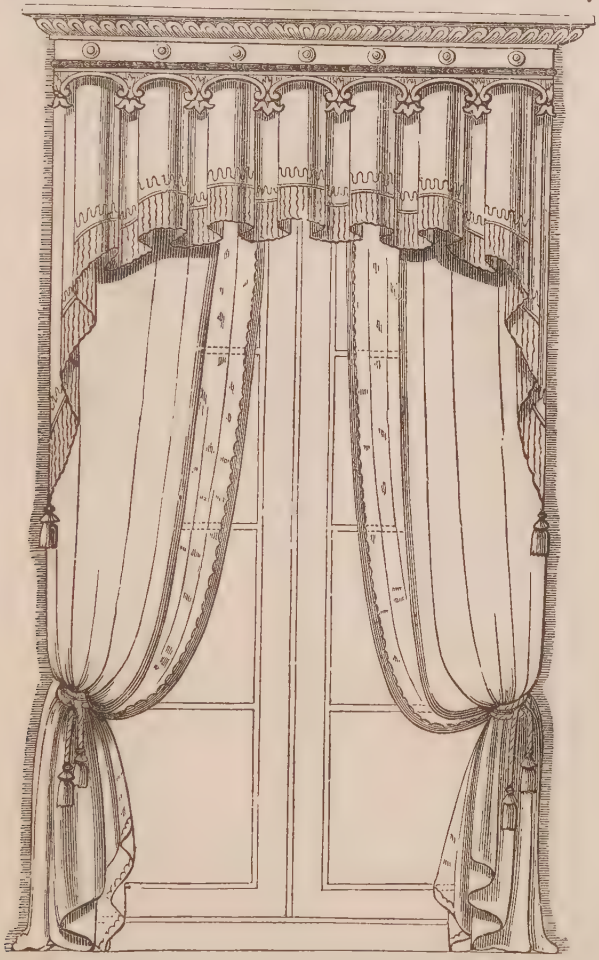
1976



(so called because it is made in the style of epaulets, the pendent part of which is called bullion, though for what reason we have not been able to discover,) with silk drops. The curtains are tied up with tassels and bands, instead of being fastened back with brass pins; a hook being placed on the architrave, on which the band is slipped. In general the material and colour of window curtains should be the same as that of the other drapery in the room; for example, as the covers of sofas in drawing-rooms and as bed curtains in bed-rooms. In the cases of dining-rooms and libraries, where there is no other drapery than that belonging to the window curtains, the colour, and the material of these should be such as to harmonise with the colouring, and style of finishing and furniture, of the room. For example, if the furniture be chiefly mahogany, the material of the curtains should be moreen or cloth; and the colour should be of the same tone, and strong or dark; say some shade of red, brown, or scarlet. If, on the other hand, the furniture be chiefly of oak, or of different-coloured foreign woods, the or other light-coloured cloth, or moreen, or some description of chintzes or cottons, will be more suitable; in both cases the colours in the carpets should be in part those of drap window curtains. When the chairs of a room are covered with cloth, the principle of

unity requires that this cloth, and that of the window curtains, should be the same both in kind and colour.

Fig. 1977 is another drawingroom curtain, in which muslin hangings are shown beneath the damask ones. The use of curtains in living-rooms is chiefly confined to



1977

cold and temperate climates; and, even in these, they are found to convey the idea of too great warmth in summer. We except, however, muslin curtains, the use of which is to exclude insects, and in some degree to soften the direct light of the sun. In warm climates, and during the heat of summer in the temperate regions, when it is desirable to exclude heat, and, consequently, to a certain extent, light, the means which are most effective are the use of outside luffer-blinds; the glass of the windows being either altogether removed, and replaced by wire gauze or fine muslin curtains; or, as is commonly the case in England, the sashes of the window being kept open at bottom and top. In all houses whatever, it is a matter of considerable importance to moderate the light of the sun in the hottest days of summer. The advantages of this are, coolness, the almost total exclusion of insects, and the retention of colour in the different articles of furniture in the room. For this reason, as it is very desirable, in every house, whether of the poor man or of the rich, to preserve the colour of such expensive articles as window curtains and carpets, and to exclude flies, which totally destroy gilt picture-frames, and gnats, which are a personal annoyance, all houses that can afford it ought to have either shutter-blinds, or some description of outside blinds, such as those mentioned, § 2002.

Fig 1978 is a curtain with a richly carved and gilt cornice.

1978

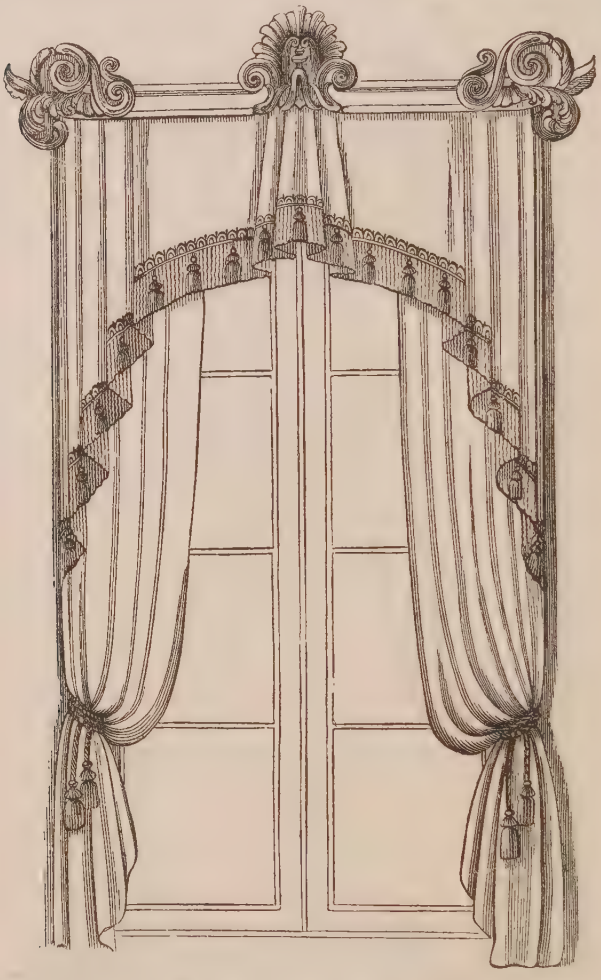
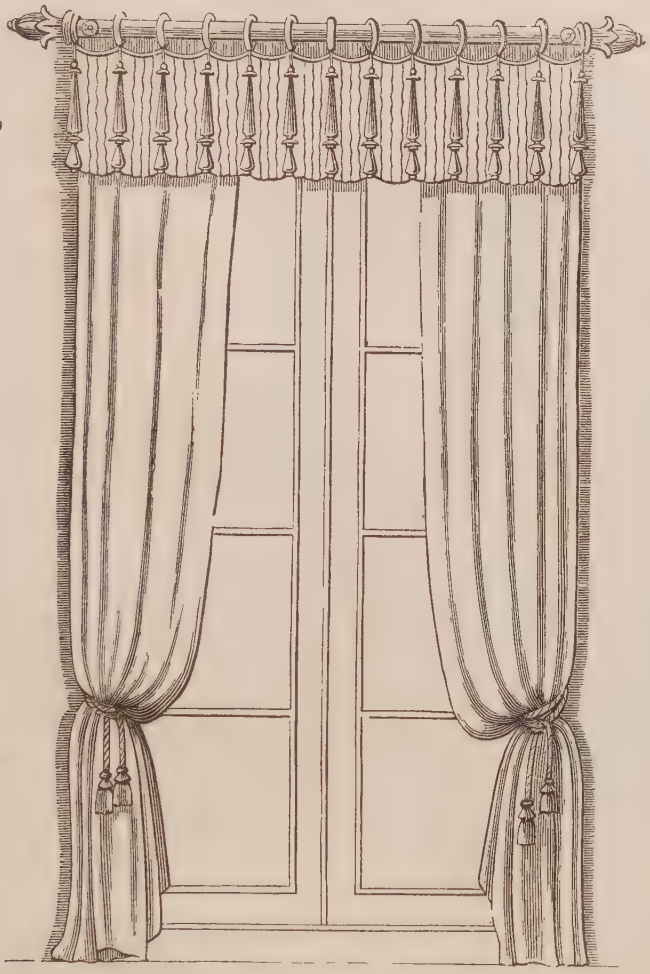


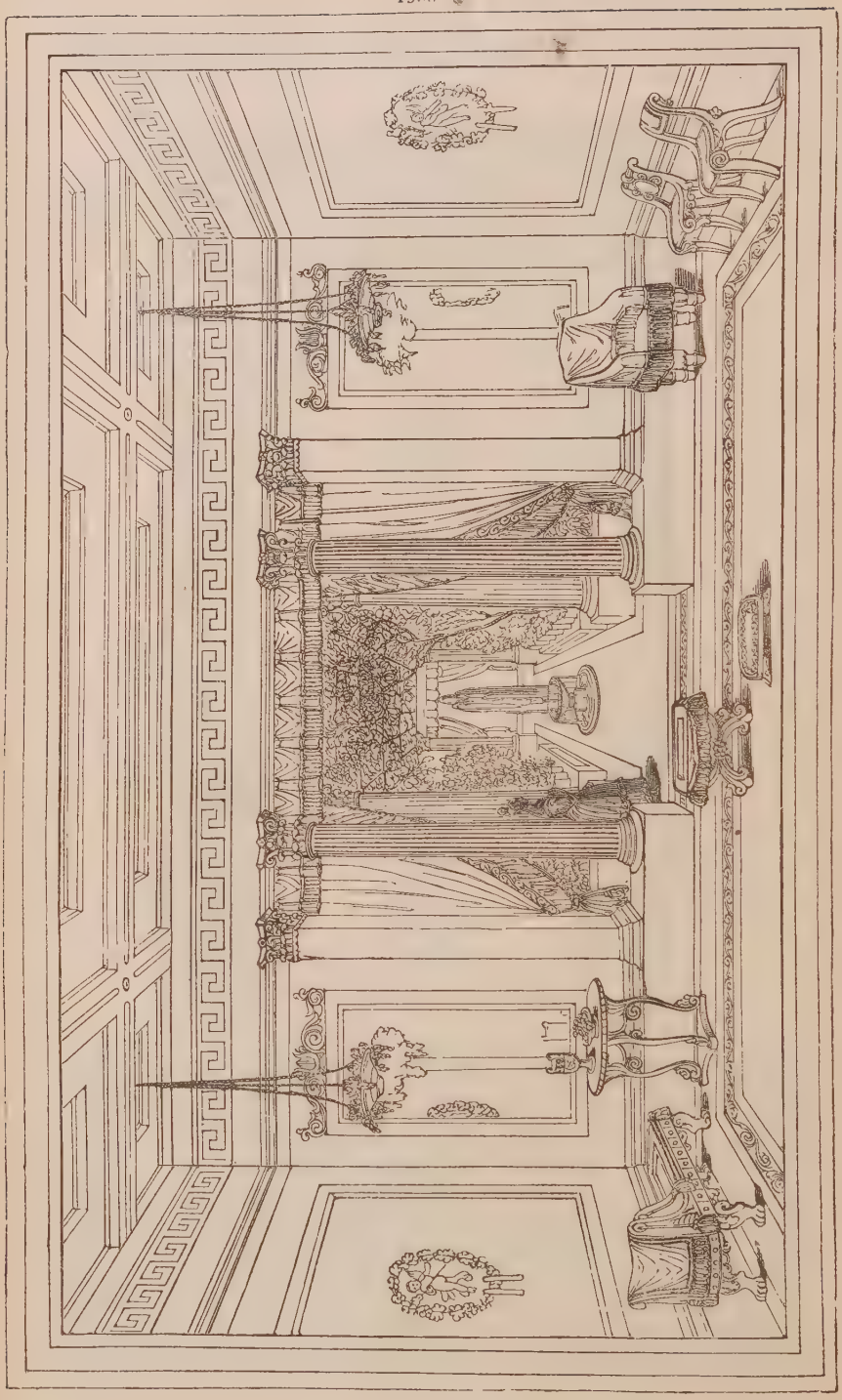
Fig. 1979 is a drawingroom curtain with a fringed valance attached to gilt brass rings, which move along a wooden pole sheathed in gilt brass. A silk drop is attached to each ring, and from each ring the fringe forms a swag (curve). The curtains draw behind the valance on a rod, as before described, § 669. As far as we have observed, the taste of upholsterers is much more correct in window curtains, and in hangings and draperies of every description, than in articles of furniture where form is chiefly concerned. We can only account for this from their being, in this department, under the control of a more enlightened public opinion, viz. that of women; who, from the milliner upwards, have generally a more correct sense of harmony in colouring than men. In the fashions of window curtains, as in almost every other article on which fashion operates, the change is alternately from simple to complex, and from what is old to what is new. The prevailing taste is for simple draperies, and the four Designs here given we consider to be nearly unexceptionable. It is a great advantage, in every description of hangings, to have them so put up, as to be easily taken down and cleaned; another desideratum is, that they can be easily drawn and withdrawn; and a third, as Mr. Robison judiciously remarks, is to have the folds perpendicular, in order that they may not harbour much dust. A variety of useful details respecting the hang-

ing of curtains and window blinds will be found from § 669 to § 675; and those ladies who may wish to cut out their own curtains will find every thing they can desire in the *Upholsterer's Accelerator.*

1979

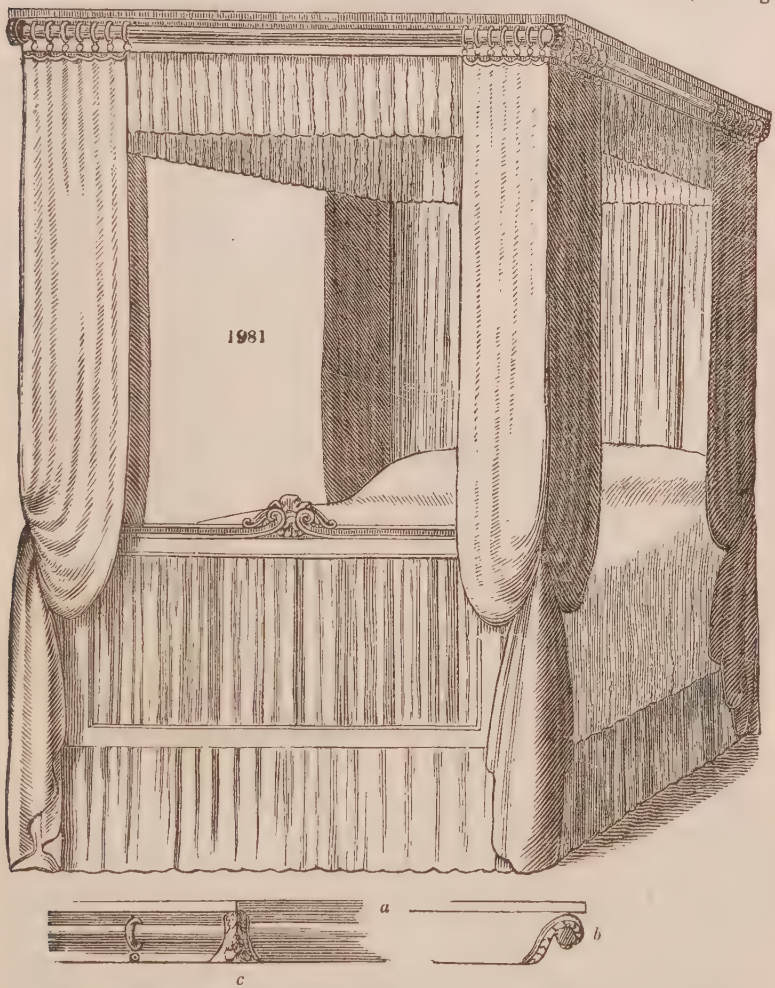


2131. *The General Appearance of a Drawingroom fitted up in the Grecian Style* is given in fig. 1980. This Design is by Mr. Lamb, who observes "that this room communicates with a library through a conservatory. The opening to the latter should have shutters with their backs lined with looking-glass, for effect when they are closed at night; it should also have glazed sashes to let down, when it may be found necessary to close the room in the daytime. These shutters and sashes should be in three parts, to slide in grooves; the centre forming one panel. Within the room, on the sides of this opening, are large looking-glasses, and in the four angles from the ceiling are suspended glass vases for flowers. The whole of the decorations should tend to give a lively character to the room, and flowers will materially assist in doing so. The opposite side of the room should exactly correspond with this, and should open upon the lawn." We need hardly say that we think this Design one of great beauty and novelty. The idea of a suspended glass jardinière appears to us much more elegant than shutting flowers up in the drawer of a table, as before alluded to. Mr. Lamb's furniture is, like his Architecture, always in good taste, and always combining novelty with correctness of design and harmony of style.



Subsect. 6. *Grecian and Modern Furniture for Bed-rooms and Dressing-rooms.*

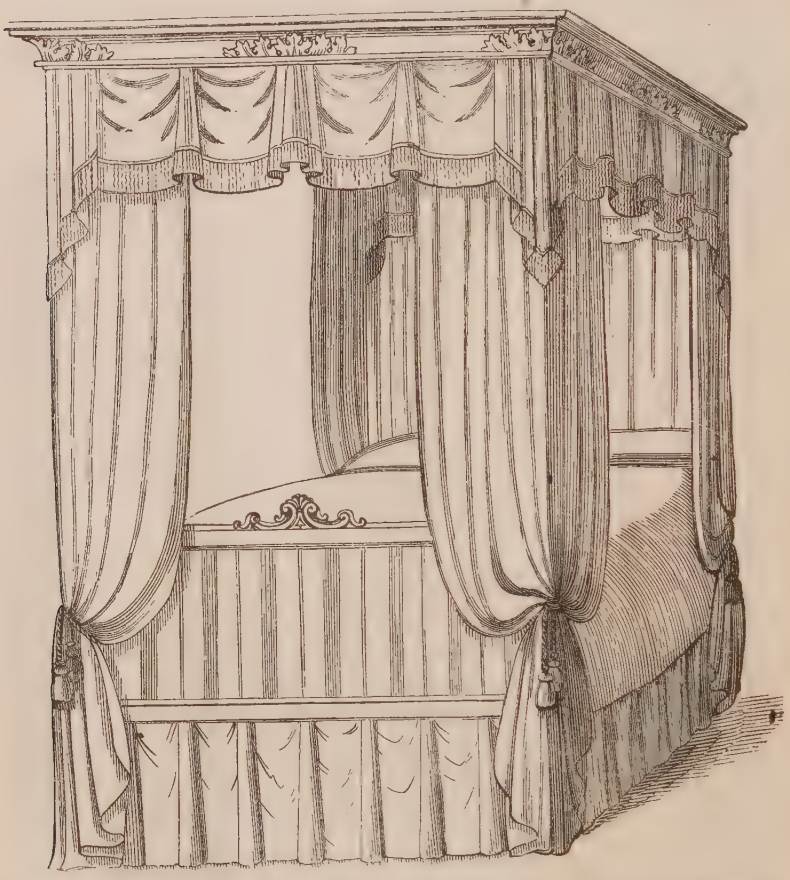
2132. *Bedsteads.* Fig. 1981 is a bedstead with a mahogany ogee cornice, in the hollow of which is fixed a small brass or bronzed rod, *a*, by a bronzed or brass bracket, *b*, which is placed on the angle of the cornice; *c* shows the front of the bracket, looking



at it on the angle. The curtains are hooked on to the rings in the manner described § 669, and there are small roses sewed on over each hook, which add much to the effect. There is a fringed valance inside the cornice. The headcloth and tester are fluted in a particular manner; that is, with one wide flute and a narrow one on each side of it, leaving a space between it and the next flute. The footboard, which is made to slide out and in, is fluted to correspond with the head cloth and tester. The curtains may be looped up by a small cord. All bedsteads should have castors with wooden wheels; a variety known as the French castor is considered the best.

Fig. 1982 is a four-post bedstead and furniture, with the cornice of mahogany, and French-polished. The mahogany cornice is considered to be much preferable to a painted and japanned one, both in point of effect and in durability; though it is somewhat more expensive. The curtains of all beds ought to correspond with those of the windows of the rooms in which they are placed. Chintz is generally preferred for bed-curtains, as it admits of being washed. Bed curtains, when of chintz, are generally lined with cotton of a different colour, sometimes plain and sometimes spotted. Dyed

1982

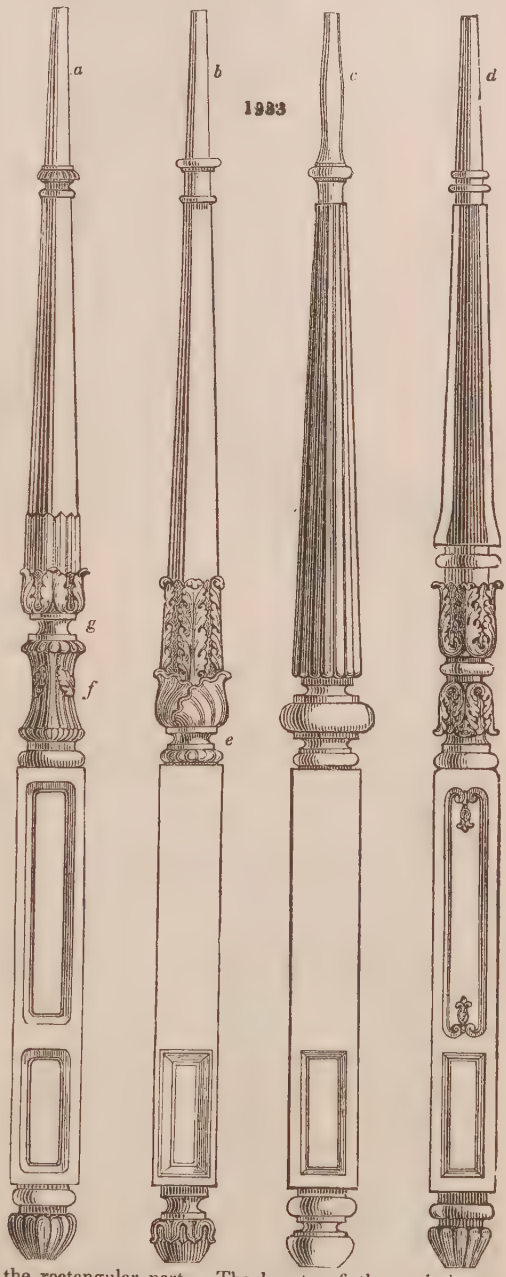


linings were formerly common, but they have now given way to plain white or spotted ones; the reason for which is, that the latter will admit of being washed, without injuring the colour of the spots, which the former do not. Dimity curtains, for both beds and windows, are considered in good taste, especially in the country, where they keep long clean. Moreen used to be employed for the hangings of best beds and bed-room windows; but it is now considered as apt to harbour moths and other vermin; and therefore, in these economical times, it is much less used than formerly. It has, however, the advantage of not taking fire so readily as chintz or dimity; but were these latter, immediately after being washed, dipped in a solution of alum in clear water, they would be rendered much less liable to injury from fire than moreen, or any other stuff of which wool is the basis. Any one may prove this, by trying the effects of a solution of alum on a cambric pocket handkerchief.

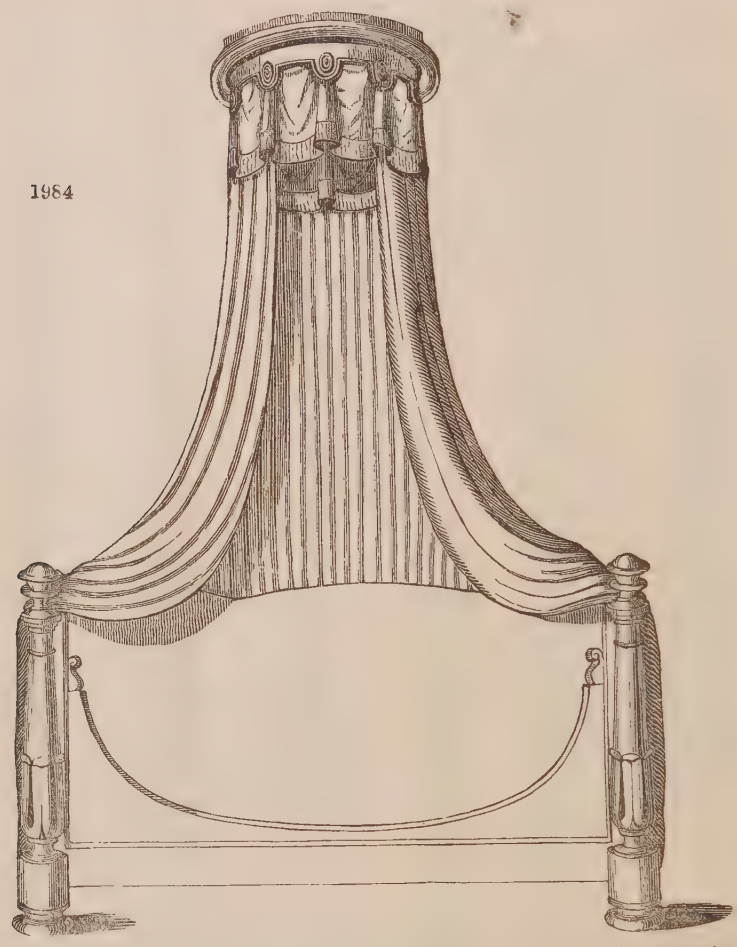
2133. *French Bedstead.* Fig. 1984, to a scale of half an inch to a foot, is a French bedstead with a circular top; and with round projecting pillars in front, in which the castors are concealed. The drapery may be of chintz, dimity, or muslin, so as to correspond with the window curtains of the room.

2134. *Bed Pillars.* Fig. 1983 shows four patterns which may be executed in mahogany, oak, or beech; or they may be made of deal, and painted and grained. These four patterns of bed-pillars will be considered by most persons, as well cabinet-makers as others, to be very handsome; and it may be worth while to enquire in what their beauty consists. The first thing that strikes the eye in them, after surveying their general form, is the quantity of carving with which they are decorated, and the different narrow-turned necks or mouldings, which occur on that portion of the pillar, which is

above the square, or rectangular part. How far then may this carving, and the introduction of these necks, or circular parts, be admitted, and yet be consistent with architectural design and taste? The answer on architectural principles is, just so far as they do not interfere with the expression of the pillar. The next question is, what ought this expression to be? First, suitableness of strength and form to its use; and, secondly, the expression of some kind of beauty or style, for the gratification of the beholder. The lower part of the pillar is very properly formed square on the sides; because that form is best adapted for being mortised to receive the tenons by which it is joined to the framework of the bed. The upper part of the pillar is conical or tapering; and it is smaller than the lower part, because the same kind of strength and application is not there wanting; this part having only to support the perpendicular pressure of the roof. The feet, claws, or bottom knobs, of the pillars are brought to points; partly, we may suppose, because, the narrower the space on which a foot can stand, the more easily is it adjusted to any surface on which it may happen to be placed; and, partly, because the only kind of strength required there being that of resisting perpendicular pressure, the trouble of preserving the square form becomes unnecessary. Thus it would appear, that, as far as expression of purpose is concerned, these bed-pillars are, at least, unobjectionable; and we shall now, therefore, examine them with respect to their expression of beauty or style. It is a fundamental principle, both in nature and art, that the stronger and more massive parts of any object should support the lighter and more elegant forms of it; and this is, which is the cause of the satisfaction which we feel when we see a cylindrical column placed over a square pedestal, and the conical upper part of the bed-pillars, in the Designs before us, rising out of the rectangular part. The beauty of the conical part of these pillars is great, in proportion as one part seems to arise out of another; and

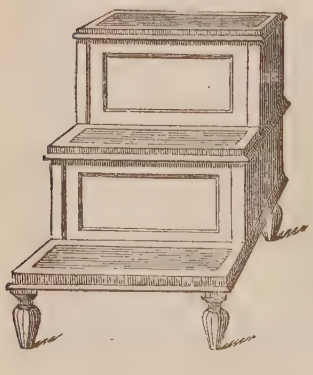


1984

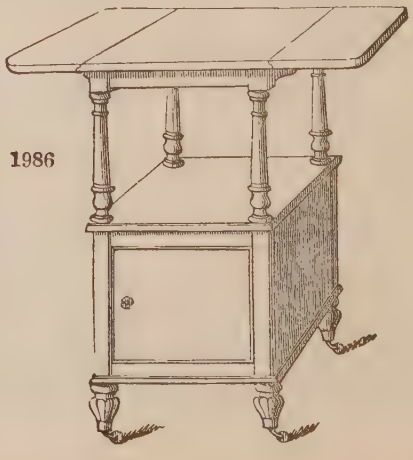


as no part which follows seems to counteract that which went before. In this point of

1985



1986

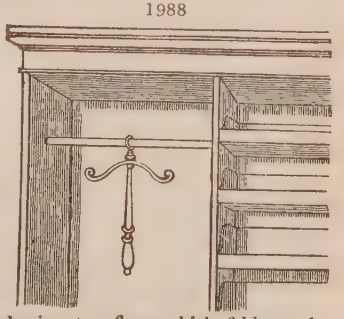


view, the most satisfactory of these pillars is that marked *b*; because the base of the conical part being commenced by the mouldings at *e*, the upper part of the cone appears to rise beautifully out of the foliage over it; whereas, in the Design *a*, the continuity of the cone is first interrupted by the hollow at *f*, and afterwards by the neck at *g*, though above this last letter, the cone rises in a satisfactory manner from the foliage which embraces it. In the Design *c*, the cone rises satisfactorily from the double neck; but the Design *d* is altogether bad, from the multiplicity of its parts, the apparent weakness and want of continuity and of cooperation in its lines, and the obvious efforts of the designer to display ornament and produce novelty. Of the feet of these different Designs, that of *a* is unquestionably the handsomest; and that of *c* the worst, in as much as it approaches nearer than any other to the expression of weakness. If the preceding reasoning be found correct, it follows that, beautiful as these bed-posts appear to be on the first glance, yet that, when examined and tested by principles, there is not one of them to which great objections cannot be made. If the foot, or claw, as it is technically called, of *a* were substituted for the claw of *b*, then *b* would be the pillar most to our taste; and next would be the pillar *c*, with the same change effected on it. In this case, as in most others, the great fault is the deviation from simplicity. The cause of this fault is, that, in London, so great has been the demand for cabinet furniture, and so ardent the desire for novelty, that the great and incessant efforts of the upholsterer are directed to the production of something new; and that this demand for novelty, instead of being met by taste and invention adequate to the supply, has only called forth mechanical changes or combinations of forms. The essential cause of this is the want of discrimination on the part of the public, between what is a mere mechanical change in the disposition of parts, and what is really original design in composition.

1987

2135. *Bed-steps.* Fig. 1985 shows a set of bed-steps, with two of the steps arranged as cupboards. The tread of the top step is hinged, and lifts up; the middle step pulls forward; and when drawn out its lid lifts up, and shows a space for a bidet, or other convenience. Where there are steps of this kind on each side of a bed, the middle step of the one may contain a night convenience, and that of the other a bidet.

1988

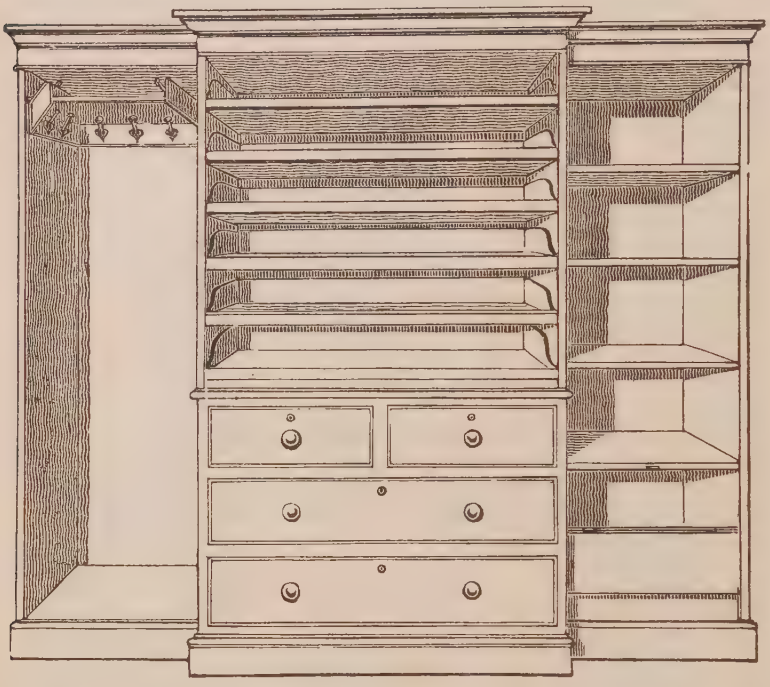


2136. *Bed Cupboard.* Fig. 1986, on a scale of three quarters of an inch to a foot, forms a very convenient cupboard, with a shelf and top having two flaps, which fold out for books, &c., so as to form a table at pleasure, and thus disguise the use for which it is principally intended. Pieces of furniture of this kind are often made in the shape of pedestals, square or round, with marble tops, shelves within, and a hinged door opening from top to bottom.

2137. *Wardrobes.* Fig. 1987, to a scale of half an inch to a foot, is a lady's winged wardrobe, to be made of any fine wood, French polished, and showing no brasswork in any part of the front. The knobs are of mahogany or ebony; the mouldings on the

doors are made to project; and the fronts of the drawers are made to recede, and to have a moulding raised upon them. Fig. 1989 shows the interior of this wardrobe. In one

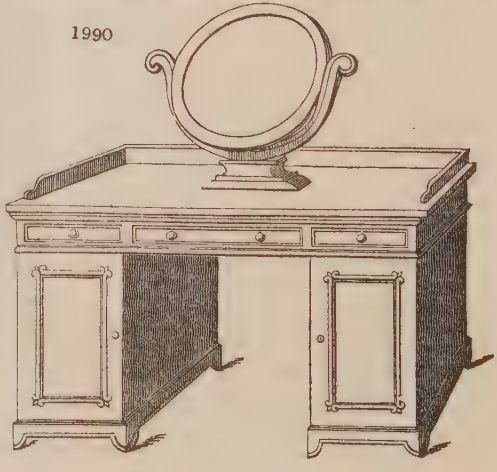
1989



wing there is a rail with pegs, for hanging dresses, which folds out in the centre, so as to enable a greater quantity of articles to be hung upon it. There is a shelf above the rail, for holding shoes, &c. In the other wing are four shelves, for bonnets; and below is a locker, for dirty linen, the front of which folds down, and, when closed, fastens by a catch. The centre part contains five tray shelves and four drawers.

Fig. 1988 shows a portion of the interior of a wardrobe, containing a horizontal brass rod, on which is hooked another article of brass, having two arms, or cross-pieces, to put into the arm-holes of ladies' dresses; a number of which by this means may be hooked on to the rod, and slid backwards and forwards on it, so as to be examined, or taken off, at pleasure. This is found by far the most convenient and economical mode of hanging up ladies' dresses, without in the slightest degree creasing or otherwise injuring them. The other part of this wardrobe contains seven press shelves, and a deep drawer for holding bonnets, &c., as described in § 626. Presses are often made four feet six inches, and even seven feet, wide, for the sole purpose of holding dresses, with a horizontal rod, as in the figure, and with a number

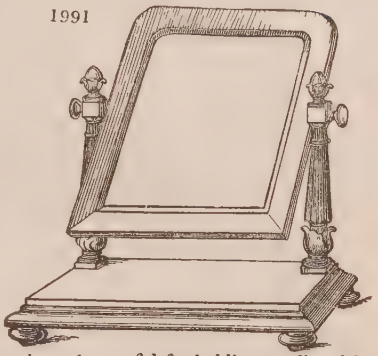
1990



f brass arms hooked on it. A variety of other forms for wardrobes will be found among the cottage furniture, § 626.

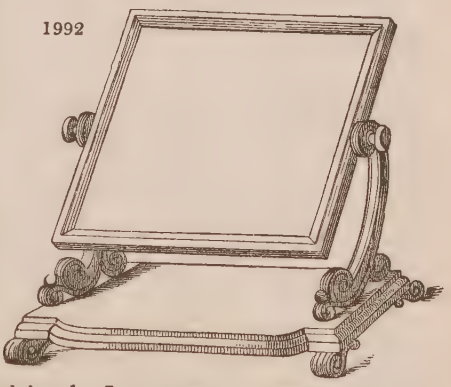
2138. *Dressing-Table.* Fig. 1990, to a scale of half an inch to a foot, is a lady's enclosed dressing-table on pedestals. There are three drawers in the frame, and the pedestals have doors, with shelves or drawers within. There is a glass fixed on the top, and the castors are hidden in the plinths of the pedestals. This very useful piece of furniture is often made without the glass being fixed.

1991



2139. *Dressing-Glasses.* Figs. 1991 and 1992, to a scale of three quarters of an inch to a foot, show patterns for dressing-glass frames, which are now seldom made with drawers. Drawers, however, seem not only to be useful for holding small articles necessary for the toilette, but advantageous as forming an architectural plinth or base for the support of the glass, as well as to prevent it from being blown over by the wind. When dressing-glasses have no drawers, the frames are generally loaded with lead, to prevent them from being blown down.

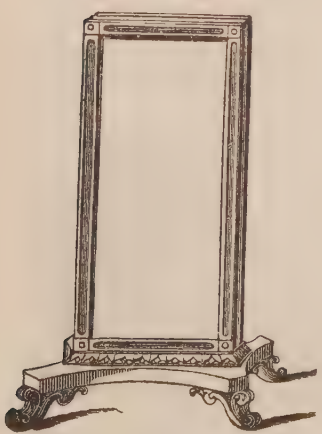
1992



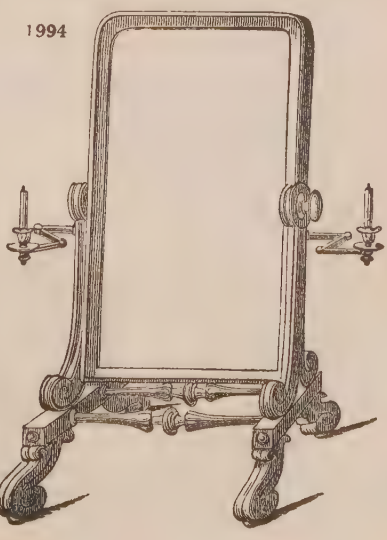
2140. *Cheval Glass.* Fig. 1994 is a cheval dressing-glass, with castors concealed in the feet, and with the face of the frame beveled. It has brass or bronzed candle-brancher, which turn round with joints; and the centres or screws on which the glass turns have knobs of wood fixed over the iron screws to hide them. Fig. 1993 is a cheval glass of a more simple construction.

2141. *Wash-hand Stand.* Fig. 1995 is a wash-hand stand of mahogany, with a marble top and wash-board. It contains two drawers, and a shelf below with a circular piece of marble fixed on it, for the ewer to stand on. The best

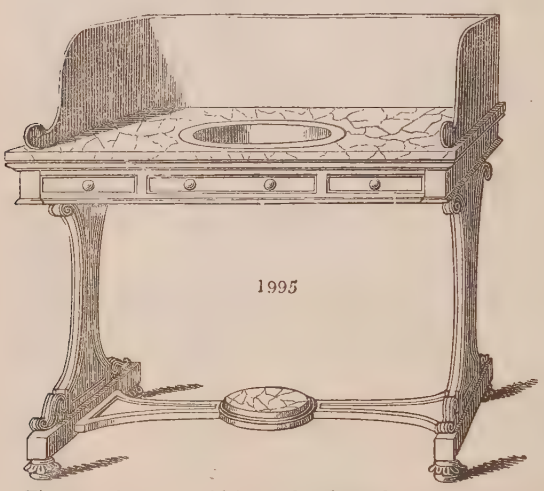
1993



1994

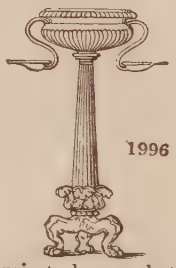


kind of marble for wash-hand stands is the variety of French marble known in London as St. Anne's: it is not so light as some blue-veined marbles, but it is considered much more durable than any other, from the lime being chemically fixed, by combination with iron, in such a manner as to prevent the latter from being easily acted upon by the alkali of the soap. The price of marble being now greatly reduced, in consequence of the application of steam machinery to its sawing and polishing, the tops of wash-hand stands, and other articles of bed-room furniture, are very frequently made of it.



1995

Fig. 1996 is a vase, which may be of marble or of cast iron bronzed, or of various other materials, supported on a cast-iron bronzed column, with projecting handles to serve as soap-holders. If this article were made a fixture, two small tubes could be conducted up the supporting column, the one to supply clear water, and the other to carry off the dirty water. This elegant Design is by Mr. Mallet.

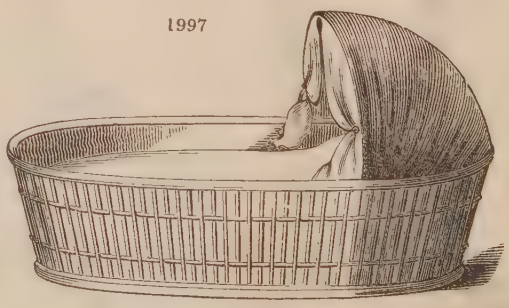


1996

2142. *A small Ebony Waiter or Tray* is frequently used for holding jugs, &c., of hot water, for the washing-table: they are eight or nine inches in diameter, turned, with the edges projecting over, so as to serve as a substitute for handles. This, however, is not the only article of furniture and furnishing that we have omitted to figure and describe in this work. The truth is, that there are hundreds of small articles required in furnishing a house, which might have been introduced in a work professing to describe and figure all the utensils, implements, and instruments used in private houses: but our principal object is, to communicate our ideas on the taste or no taste of the more conspicuous articles of furniture at present generally fabricated.

Subsect. 7. *Furniture for the Nursery.*

2143. *Bassinet* (barcina, *Sp.*, a rush basket). The first piece of furniture which an infant can be said to use is a bassinet, or portable bed. Fig. 1997 is a bassinet two feet and a half long, the frame of which is made of wicker-work, with a hood which falls backwards or forwards as required. It is generally lined with printed furniture, or sometimes with dimity, to keep out the draught. The hood is covered with furniture, and two little curtains drop down from its front, which are looped up with tapes or ribands in the same manner as tent-bed furniture (see fig. 698). A hair mattress stuffed very soft, and a small down pillow, complete the bed. "The advantage of this bed," Mr Dalziel observes, "is great; as the child, when asleep in it, is protected from currents of air from whatever direction they may come. The child may also be removed in it



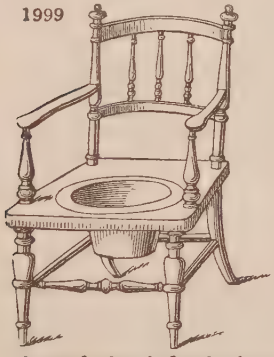
1997

from one room to another without being disturbed. A mother will find such a bed particularly useful in the evening when the child is asleep beside her in the sitting-room; because it need not be disturbed, but may be carried in the bassinet to the bed-room, and there placed by the side of the bed; whereas, if the child were asleep on a sofa, its removal, by taking it up in the arms, would be certain to awake it, and the mother might lose her rest for several hours."

2144. *Cribs* have been already figured and described § 662. They come into use after the bassinet; that is, when the child is about a year old, and has been weaned. We may here mention a description of crib, which has hooks or other fastenings; by which, when one side of it is taken out, the crib can be made fast to the side of the mother's bed, so that she may have access to the child during the night, by merely stretching out her arms, and taking it to her.

2145. *Chairs* are the next articles made use of by children; and those about London are of four kinds. Fig. 1999 is a child's chair of the first kind, having a night pan, and a matted seat. A small stuffed flannel of the size of the seat, and having a round hole in the centre, is generally placed over it when it is to be used, in order to prevent the pan from hurting the child. (In some districts of Italy, and other parts of the Continent, rings of stuffed cloth, or stuffed leather, or of rush matting, are used for the same purpose by grown-up persons.) In England, infants of ordinary health and strength are put into chairs of this kind, when between three and four months old.

1999



1998

Fig. 1998 is a child's high chair, to be used when it first begins to sit at table. There is a bar or stick put across between the arms, to keep the child from falling out, and sometimes there is a foot-board. A child in average health is put into such a chair when about twelve or fourteen months old.

2000

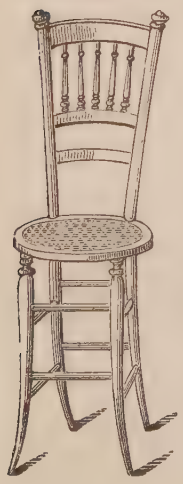


Fig. 2000 is an Astley Cooper's chair; being a form recommended by that eminent surgeon, with the view of preventing children from acquiring a habit of leaning forward, or stooping; the upright position of the back affording support when the child is placed at table, and eating, which a sloping-backed chair does not. It is proper to observe that some medical men do not approve of these chairs.

2001

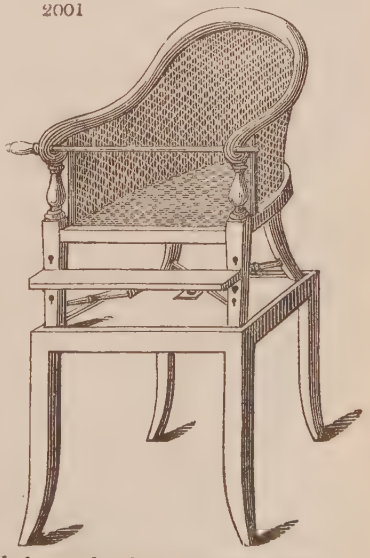
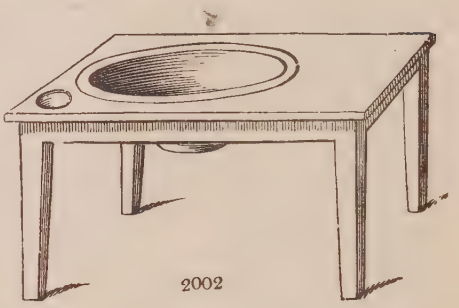


Fig. 2001 is a child's elbow-chair, or bergère, as it is commonly called in England. This chair stands on a stool, to which it is attached by a thumb-screw; and, when the

chair is removed from the stool, the latter forms a table for the child to put its playthings on. The shelf for the feet is made to move higher or lower as may be required. The chair is only fixed on the stool when the child is to sit at table to eat, which it may do when about eighteen months of age.



2002

2146. *A Child's Washing-stand.* Fig. 2002 is a child's washing-stand, consisting of a table about eighteen inches high, with a large basin and a soap cup sunk in one side of the top. The table is made lower than a chair, in order that the nurse may have the more power over the child when she is washing it. When the child is only a few weeks old, it is immersed, or bathed in the basin; but as it grows larger, it sits on the top of the table, with its legs in the water.

Sect. II. *Gothic Furniture for Villas.*

2147. *The Designs for Gothic Furniture* which we shall submit are few; because such designs are, in general, more expensive to execute than those for modern furniture; partly from the greater quantity of work in them, but chiefly because modern workmen are unaccustomed to this kind of workmanship. What passes for Gothic furniture among cabinet-makers and upholsterers is, generally, a very different thing from the correct Gothic designs supplied by Architects who have imbued their minds with this style of art. Wherever, therefore, a house is to be furnished in the Gothic style, we repeat our recommendation to put the whole under the direction of a competent Architect. Indeed, it would be of great advantage to the wealthy, who have not leisure themselves to attend to the subjects of taste and purity of design in furnishing their houses, if they were, on every occasion, not only of furnishing a room, but even of adding or changing a piece of furniture in a room already furnished, to consult an Architect before doing so; since nothing is more common than to find the style (in regard both to art and expense) in which a house is furnished, totally at variance with its external Architecture. Even in single rooms, we find the most heterogeneous mixtures of forms and colours, arising from the desire of the occupant to possess such or such a particular article of furniture, which has been seen somewhere else, without at all considering propriety either with regard to expense, style, or effect. This arises from one of the most common errors of mankind; viz., that of looking to parts by themselves alone, and not considering them with reference to the whole to which they belong. We have before observed, and it cannot be too deeply impressed on the mind of the reader, that the first glance at the exterior of a house, like hearing the sound of the first bar of a piece of music, ought to give a correct idea of the style of all which is to follow. Whoever has cultivated a taste for architectural beauty must feel the force of this truth.

2148. *Previously to the Time of the Tudors,* Mr. Hunt observes, "household furniture was in general of a rude substantial character: the tables were formed of boards on tressels; the seats were massy oak benches or stools; and the floors were strewed with straw." (*Chaucer.*) The higher orders had, nevertheless, many costly and splendid articles: such as embroidered beds, tapestry hangings, and magnificent plate. From the time of Henry IV. to that of Henry VI. it appears that the same style of furniture prevailed throughout Europe. An improved style was introduced into England during the reigns of Henry VII. and Henry VIII., in consequence of the encouragement held out by those monarchs to induce artisans of all countries to settle in their dominions. Some of the handsomest pieces of furniture of those days belonged to Cardinal Wolsey, as appears by the fine specimens in the possession of John Thompson, Esq., of Frognall Priory, Hampstead.

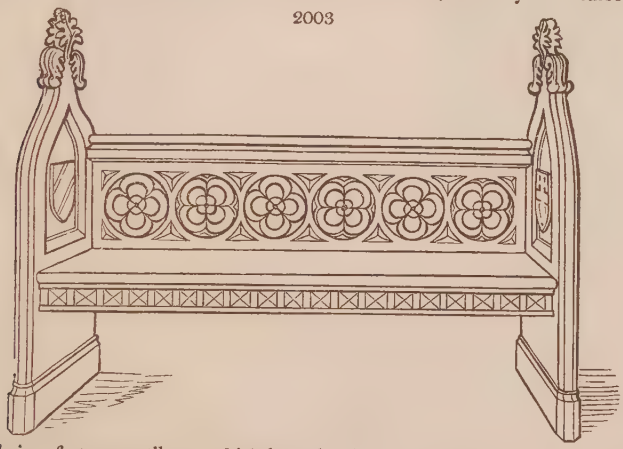
Subsect. 1. *Gothic Furniture for Halls.*

2149. *The Hall* of the manor-house, in the times when Tudor Architecture prevailed, was the usual place for dining in. It was a large room, in the form of a parallelogram, having an oriel window at the upper end, and other windows, filled with painted glass, high up in the side-walls. Near the oriel window was the dais, or raised floor, set aside for the master of the house and his most distinguished guests. Under a screen was the passage to the offices, and over it the gallery for the minstrels. The fire was originally

placed against what was called a reredoss, in the middle of the floor, the smoke ascending to the roof, and escaping there by one or by several openings, sometimes luffer-boarded, to keep out the rain. The timbers of the roofs were framed with pendants, carved, and more or less emblazoned with heraldic insignia. The " top beam of the hall," and the " roof-tree " of the Scotch houses, both terms signifying a beam of timber now seldom introduced in roofs of such massive dimensions as formerly, were common toasts both in Wales and Scotland.

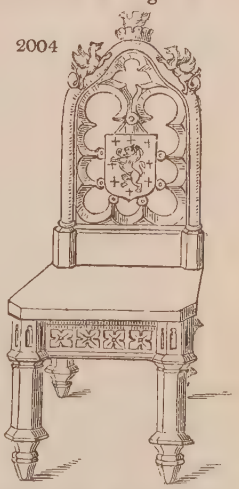
2150. *The Furniture of the Hall* consisted chiefly of clumsy oak tables covered with carpets; of benches or forms of the same material; of cupboards for plate and various articles for the dining-table; and in the centre the reredoss, or fire-iron, one of which may still be seen in the hall at Penshurst, near Tunbridge Wells, in Kent. Against this fire-iron the faggots were placed which made the fire, and they were surrounded by

2003



a raised rim of stone or tile, on which lay a fire fork and tongs. We saw this interesting hall in 1828, and Mr. Britton, who examined it in 1832, describes it at length in his very interesting *Sketches of Tunbridge Wells*. " The south side of the court is occupied by the fine old baronial *hall*, which, though disfigured and mutilated, is still an apartment of magnitude and architectural interest. It measures about sixty feet in length by nearly forty in width, and at least sixty in height. It is open to the roof, where there was a louvre, or lantern, for ventilation. Beneath it, on the floor, is the original fire-hearth, with a large andiron for sustaining the blazing log." The designs for hall furniture which follow are not to be considered as servile copies of what actually existed in the Tudor times, either at Penshurst, or any where else, but as an exemplification of that style of Architecture applied to articles suited to modern habits of society.

2004



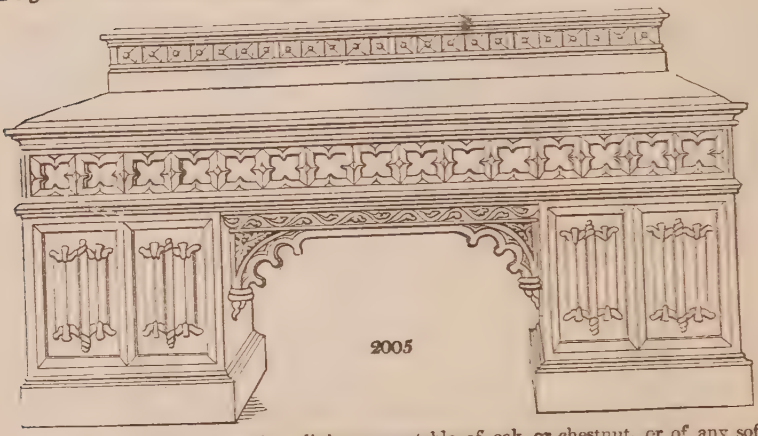
2151. *Benches.* Fig. 2003 is a hall bench, designed by Mr. Lamb. In the preceding part of this work will be found two figures of hall benches, from existing specimens, both copied from the work of Mr. Hunt (see figs. 1346 and 1347.)

2152. *Chairs.* Fig. 2004 is a hall chair, also designed by Mr. Lamb, who observes " that the heraldic devices on it should be painted in their proper colours."

2153. *Tables.* Hall tables, as we have already observed, were of a simple massive construction, displaying little ornament. The top was generally of oak planking, two or more inches thick, and the frame supporting it consisted chiefly of two massive horizontal top rails, joined to massive pillars. Sometimes there were both top and foot rails, but in the more massive designs the latter were entirely wanting.

Subsect. 2. *Gothic Furniture for Parlours and Dining-rooms.*

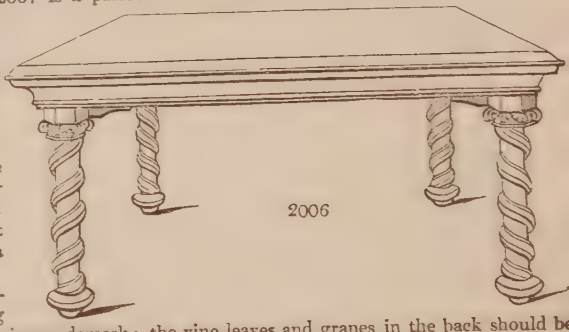
2154. *Sideboard.* Fig. 2005 is an oak sideboard, which may be either executed in that wood, or in deal and painted and grained in imitation of it.



2005

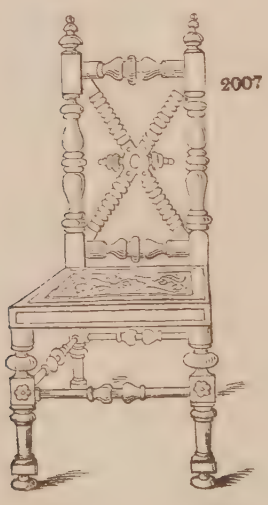
2155. *Tables.* Fig. 2006 is a dining-room table of oak or chestnut, or of any soft wood painted and grained.

2156. *Seats.* Fig. 2007 is a parlour chair turned in oak, chestnut, or any other British wood that has colour and variety in its texture. It may be painted, or even gilt, according to the character of the room in which it is to be placed. The cushion may be of figured chintz. For a Gothic chair, Mr. Lamb considers that this Design would be a cheap one.

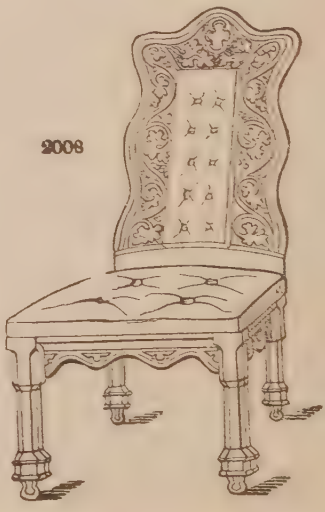


2006

Fig. 2008 is a dining-room chair, having a stuffed cushion of crimson damask; the vine leaves and grapes in the back should be painted of their natural tints.

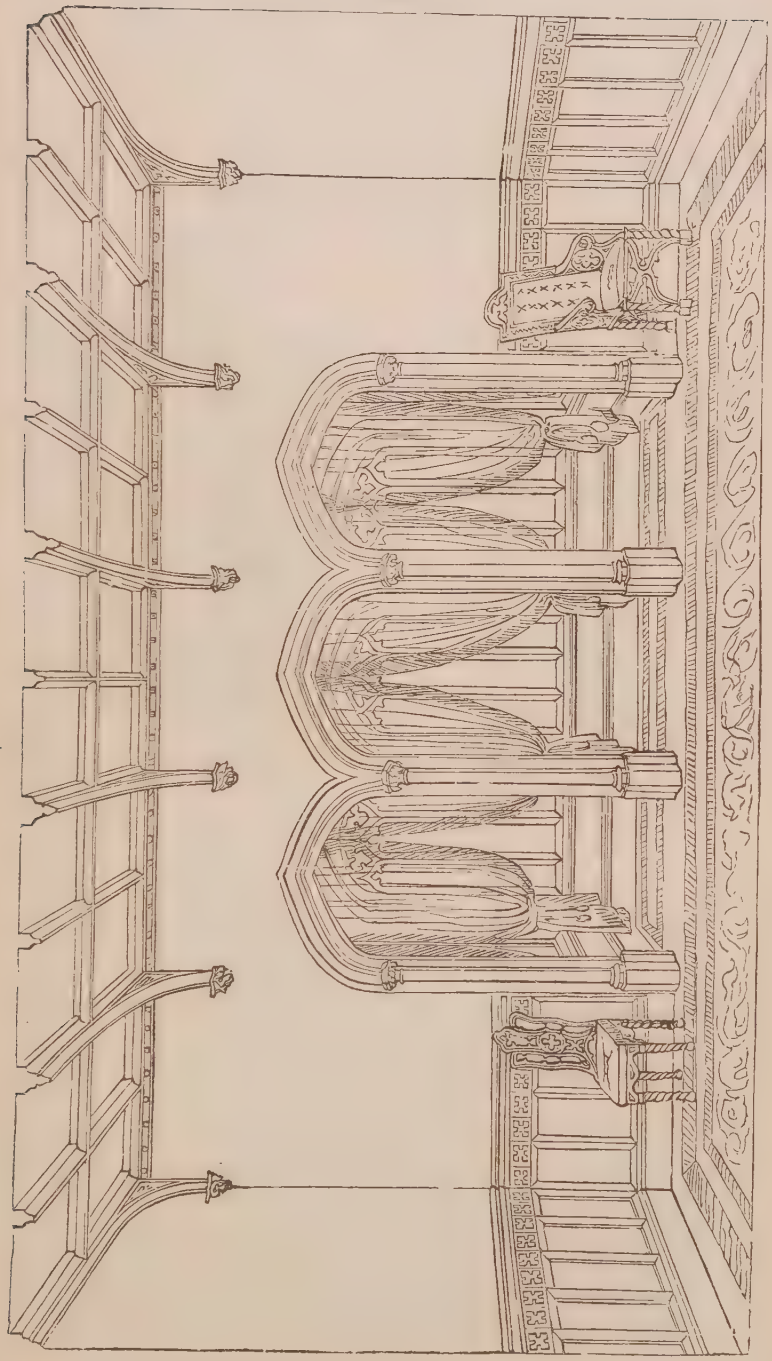


2007



2008

2009

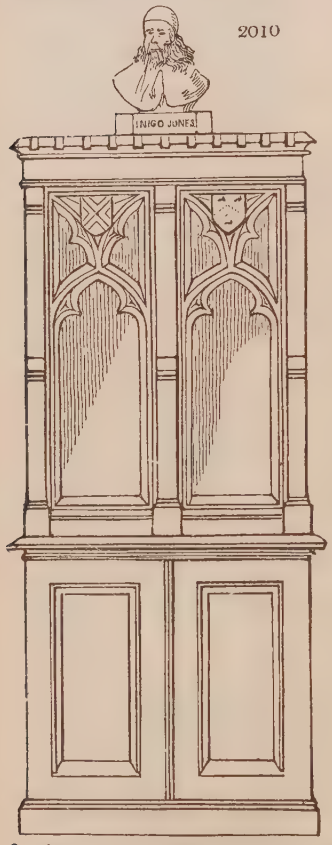


2157. *The General Appearance* of a dining-room finished and furnished in the Tudor style is shown in fig. 2009. In this Design, the curtains, Mr. Lamb observes, "are to be transparent, in order that they may not hide the Architecture of the windows. The ceiling is to be of oak, and the ornaments in the corners are to be gilt. The dado should also be of oak. The dado did not come much into use till the latter part of the Tudor period. Two additional patterns for chairs will be seen in this Design."

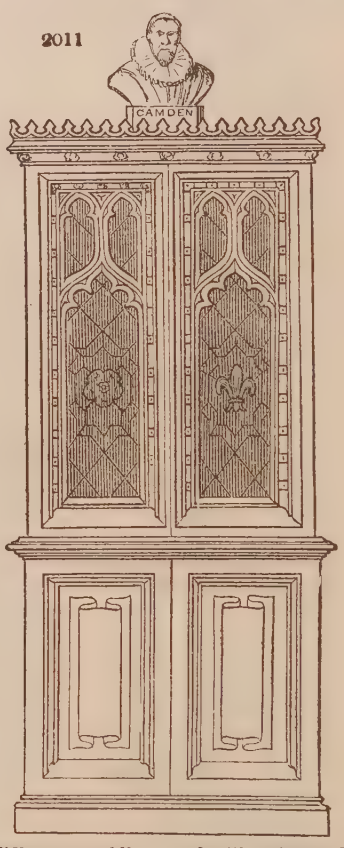
Subsect. 3. *Gothic Furniture for Libraries.*

2158. *Bookcases.* Figs. 2010 and 2011 are bookcases in two different varieties of Tudor Gothic, both remarkably plain, so as to be easily executed by any joiner who has been accustomed to fit up houses or churches in the Gothic style. Such a joiner will,

2010



2011



for the most part, have the proper tools for the different mouldings, and will understand better what they are, than even a cabinet-maker, who has always been executing designs in the modern style.

2159. *Seats.* Fig. 2013 is a carved oak arm-chair, with a cushion of green and gold.

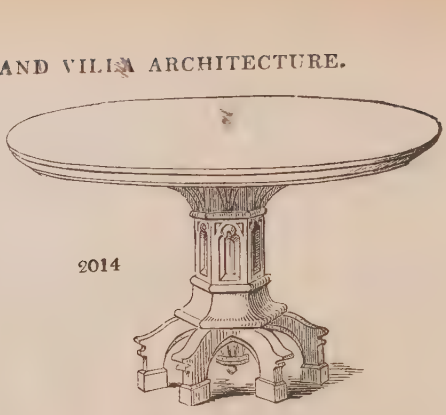
2160. *Tables.* Fig. 2014 is an oak table, which will serve either for a parlour or a library, the pillar might be of cast iron, properly painted, and the top might be of marble. Our correspondent Mr. Robison has sent us a very handsome design for a table somewhat resembling this in general form, but made entirely of cast iron and marble, which he has had executed in Edinburgh, and finds to be "handsome, serviceable, and economical." The style of his house being modern, he had the base and pillar bronzed; the circular marble top was of Bordeaux marble, forty-two inches in diameter, and cost, prepared and polished at Bordeaux, and finished with a raised border, only about eighty francs. Without this raised border, it would not have cost more than forty-two francs. The freight from Bordeaux to Leith is only 3*s.* 6*d.* per cwt. We introduce these facts to show how much may be done, in the way of improving house-

hold furniture by the more general introduction of cast iron and marble. Were the taste for marble greater, and the steam-machinery for working it more generally known, there can be little doubt that the increased demand would stimulate to such an abundant supply, that the price would be lowered, and all parties be gainers.

2161. *The General View of the Interior of a Library in this Style* is shown in fig. 2012.

2012

2013

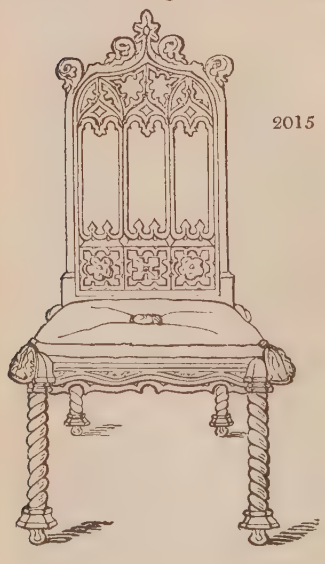


2014

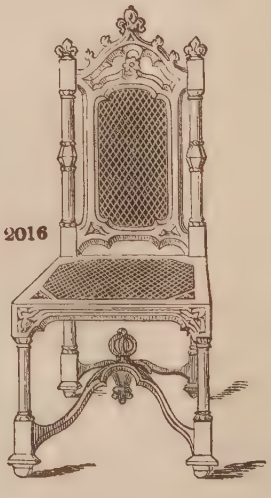
The roof is of oak, with the bosses at the intersection gilt. The shields should be painted of their proper colours. At the end of the room is an enclosed bookcase, and opposite each window is a corresponding recess for books; these recesses may have carved oak doors. In this Design, Mr. Lamb has shown two elegant chairs, a library table, and a footstool. Those of our readers who have paid any attention to the remarks which we have made, in different places in the preceding section, on modern furniture, must, by this time, have formed some idea as to what constitutes unity of style in this department of Domestic Architecture. We would direct their attention to the whole of this interior of a library, to the interior of a dining-room, and to each of the pieces of furniture in this, and the two preceding subsections, separately. In every one of these will be found the most perfect unity of style. On examining the chairs, it will be seen that there is not that discrepancy between the hind and the fore legs, that there is in the designs for chairs in the modern style. The backs also of these chairs seem to arise out of the seats, and to be firmly fixed to them, instead of being twisted about in all directions like the chairs in p. 1062. Their forms are no doubt what might be called stiff, in comparison with the forms of the chairs alluded to; but that stiffness belongs to the style. The tables, we think, are eminently beautiful; more especially the legs and pillars.

Subsect. 4. *Gothic Furniture for Drawingrooms.*

2162. *Seats.* Fig. 2015 is an oak drawingroom chair, with a stuffed cushion of blue



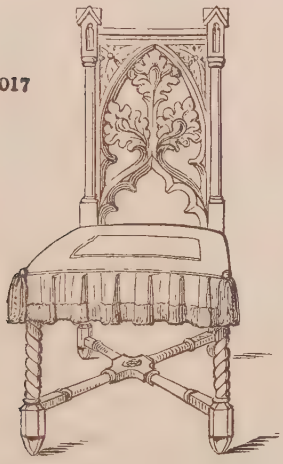
2015



2016

damask, and silver edging and tassels. We may observe here, that there is no end to the variety of form and combination which might be introduced in Gothic chairs. The Gothic style of Architecture, is, of all others, that which affords the most fertile sources of invention; not only in the forms and disposition of its masses, or principal parts, but in all its various details and ornaments. The Grecian style of art is directly the reverse. The expense of the Gothic style is the only serious objection which can be made against it. To a Briton this style is rich in associations of the most interesting description.

2017



2018

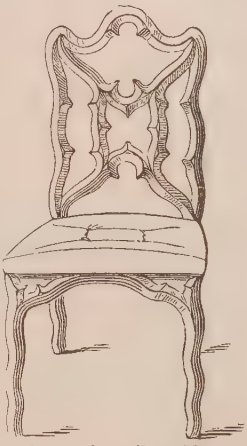


Fig. 2016 is a drawingroom chair with a cane back and seat. It may be executed in oak, or oak and ebony, the ornamental carvings being gilt. The whole chair may also be executed in any easily carved wood, and afterwards painted and gilt, so as to imitate oak, ebony, ivory, and gold. This was not an uncommon practice in the more magnificent articles of furniture of former times, as we may still see by the chairs at Knowle, in Kent, and by those in the collection of Mr. Thompson of Frognall Priory.

Fig. 2017 is a drawingroom chair of oak, partly gilt, and having the cushion of blue damask.

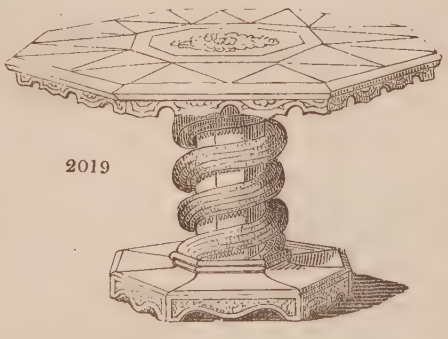
Fig. 2018 is a light drawingroom chair, made of any soft wood, and painted. The hollow moulding is supposed to be of a light green colour; the fillet gilt, and the cover of the cushion green, with gold edging.

Fig. 2020 is a stool with a stuffed top, which may serve either for a drawingroom, or a library.

2163. *A Sofa* in the Gothic style will be found in the general view, fig. 2021, and also a pianoforte; both of which are characteristics of the drawingroom.

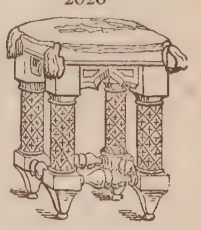
2164. *Table.* Fig. 2019 is a drawingroom table. The top is supposed to be inlaid with variously figured oak, ebony, and ivory; the pillar is of oak, encircled with ebony, and striped with gold.

2019

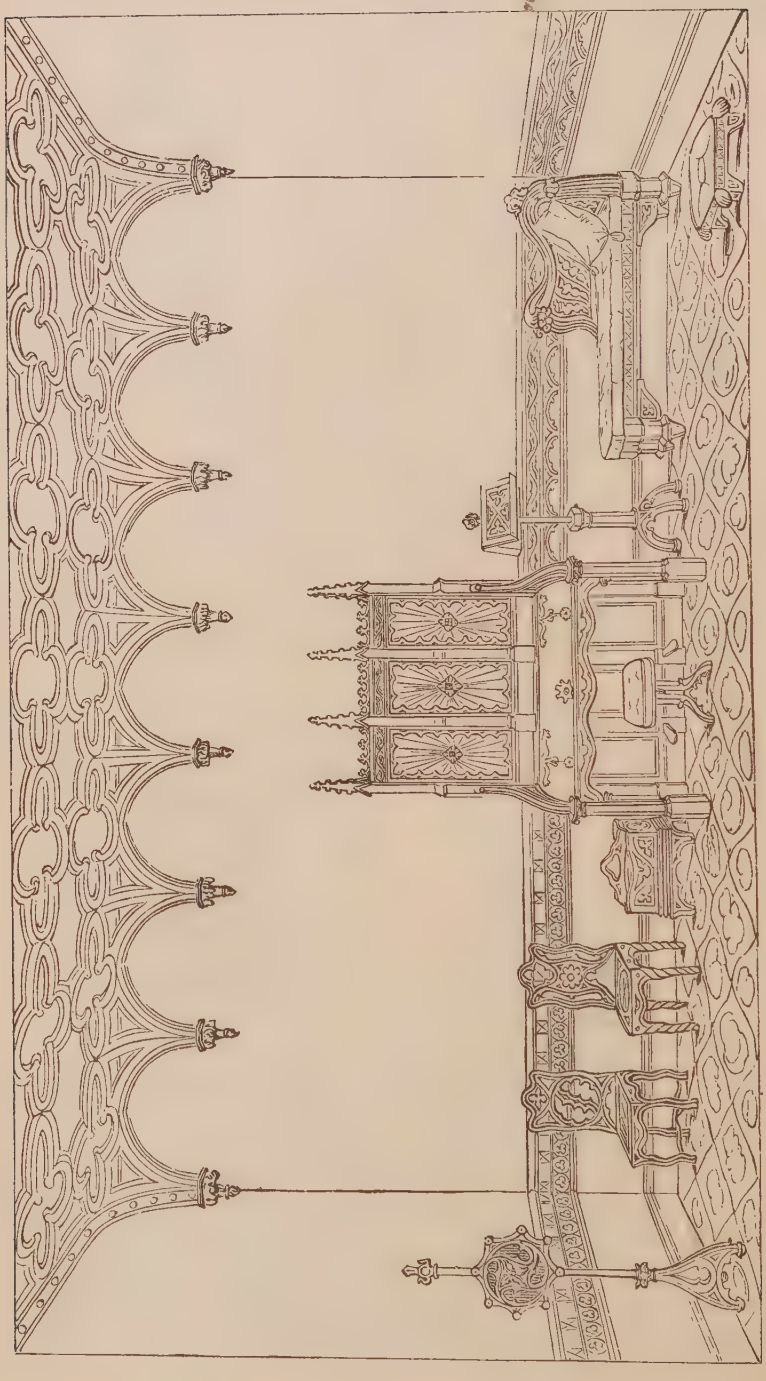


2165. *A General View of the Interior of a Drawingroom, fitted up and furnished in the Gothic Style,* is given in fig. 2021. "The tracery of the ceiling should be of oak, or of stucco painted in imitation of that wood. The fillets and flowers should be gilt; the panels painted blue, and the ornaments of the cornice also gilt. The dado should be of oak, painted and gilt. In this Design are shown two different varieties of chairs, a piano-forte, a music-stool, a music-desk, a Canterbury, a sofa, a fire-screen, and a footstool." We need not express an opinion of this interior; for every reader, we think, must be pleased with it. Even the studies of furniture which it affords are interesting; the Gothic piano-forte and music-stool, with the Canterbury on the left hand, and the music stand on the right; the Gothic couch, with its footstool; the two beautiful chairs; and, finally, the fire-screen, all claim attention, and are each separately worthy of study.

2020



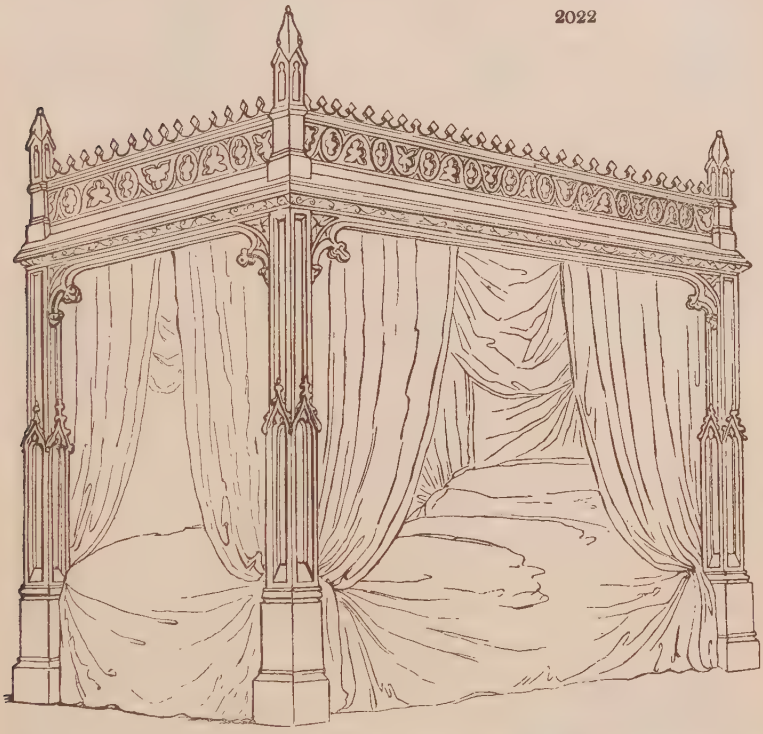
2021



SUBSECT. 5. *Gothic Furniture for Bed-rooms.*

2166. *For Chairs, Tables, Chests of Drawers, and other common Bed-room Furniture,* we have here given no designs, because any one at all conversant with the subject may easily confer a Gothic character on the different articles before given as modern furniture for the bed-rooms of cottages and villas. We are enabled by Mr. Lamb to give one Design for a bedstead, fig. 2022, which is sufficient to prove that there is no piece of modern

2022



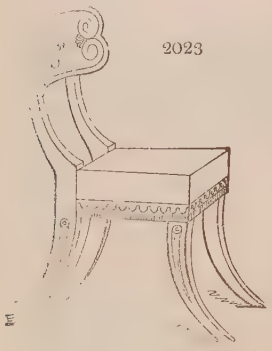
furniture whatever to which this style may not be applied with admirable effect. We have seen a number of Gothic bedsteads executed under the direction of the late Duke of Norfolk, in Arundel Castle; but none of them are correct in regard to style, or at all to be compared with Mr. Lamb's Design for splendour of general effect. Arundel Castle, our readers are probably aware, was for many years the scene of the late Duke of Norfolk's trials at building; by which, as his own Architect, he sought to instruct himself in the Gothic style. After being occupied in this way for upwards of forty years, and spending several hundred thousand pounds, he just arrived at last at that point where a man discovers his own utter ignorance. We make no reflection on the memory of the noble duke on this account, we merely state the fact. A man of overgrown wealth may be allowed to spend it in any way he pleases, as the greatest injury he can do society is to hoard it. Had the duke employed an Architect, he would, no doubt, have possessed a castle in a very superior taste, both externally and internally, to what Arundel Castle now is; but it does not follow, on that account, that he would have been so happy in seeing the more perfect works of his Architect, as he was in realising the crude ideas of his own mind. These observations cannot be considered altogether irrelevant to a work of this kind, because they will serve to teach by example the consequences of a man's attempting to be his own Architect, before he is sufficiently acquainted with the subject, to be aware of the precise state of his own architectural knowledge.

2167. *Remarks.* For all the designs of Tudor furniture in the preceding subsections, we are indebted to Mr. Lamb; whose mind is richly stored with all the forms both of modern and ancient Architecture, and whose pencil is as rapid and accurate as his conceptions are fertile. Mr. Lamb is one of the few young Architects who, like Mr. Mallet,

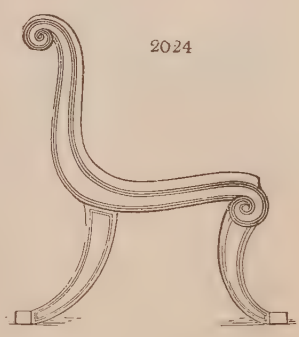
can draw with equal ease whatever comes before them. Trees, plants, flowers, animals human figures, landscapes, marine scenery, and buildings are all transferred by him to paper with equal facility and rapidity. When we mention that, in addition to this, he is, like Mr. Varden (a young Architect similarly gifted), a practical surveyor, and a drawer up of specifications and estimates, our readers may imagine how well we think him deserving of public patronage.

Sect. III. *Elizabethan Furniture for Villas.*

1. *The Style of Finishing and Furniture which prevailed in England during the reigns of Elizabeth and James I.* exhibits a mixture of the Italian Architecture with the Gothic; sometimes very rudely composed; and, at other times, in consequence of being in the hands of superior artists, forming harmonious compositions of lines and forms. The remains of furniture in this style are abundant throughout the country; and, as we have before observed, it has of late become fashionable among the metropolitan cabinet-makers to collect it. We shall give a few examples, for the sake of showing that this mixed style may be easily applied to all the articles of modern convenience and luxury. Those who wish to see designs for Elizabethan furniture on a larger scale will find whatever they could desire, by consulting the elegant work of Mr. Shaw, or the splendid description of Hatfield House by Mr. Robinson. Hatfield House is one of the most perfect existing specimens of Elizabethan Architecture externally, and of Elizabethan finishing and furniture within. Mr. Robinson's description is, therefore, a valuable reference book for Architects. The object of Mr. Shaw's work is "to extend historical correctness in art, by placing within the reach of its professors a standard authority for all articles used in domestic purposes; from the earliest period in which such specimens exist, to the reign of James I." We may here observe that the pleasure derived from seeing or possessing curious ancient furniture, is of a kind often quite distinct from that derived from seeing or possessing furniture in correct style, or in elegant forms. Let, for example, any reader observe the chair given in the next paragraph, fig. 2027, and then turn to any of the chairs shown in *Flaxman's Compositions from Eschylus and Homer*, or even look on some of those in Mr. Hope's work, figs. 2023 to 2026. There is no one who would not be desirous of possessing a chair both of the Grecian and the Elizabethan kind; but the Elizabethan chair would be valued merely as a curious piece of antiquity; while the other would be prized for its expression, for its suitableness as a seat, for its simplicity, and for the great effect produced in it by a very few lines. This effect of the Grecian chair being independent of all historical associations, since it is, in fact, merely an imaginary composition, results wholly from the beauty of the design. A chair in the Tudor style is equally expressive in its way; and is a far more perfect object as a work of art, independent of historical associations, than any description of mixed or Elizabethan chair: but, though it possesses the beauties of unity of expression and of style in the highest degree, it wants that beauty of simplicity, or that evidence of effecting the most



2023



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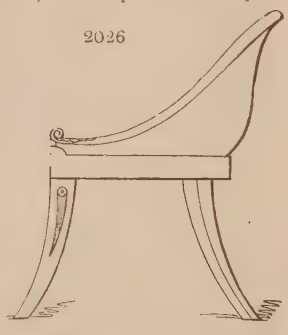
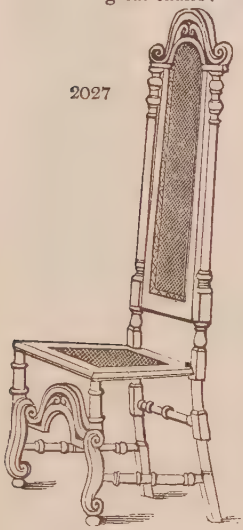


2026

important ends by the simplest means, which the Grecian chair displays, and which indeed is characteristic of the whole of Grecian art. The object of these observations is, to show that the present taste for Elizabethan furniture is more that of an antiquary, or of a collector of curiosities, than that of a man of cultivated mind.

2169. *Chairs.* In Elizabethan houses, Hunt observes, we find in most apartments two great chairs: "these were arm-chairs, with stuffed backs and sides, entirely covered, and similar to the lounging-chairs of the present day. Others, described as 'Flemish chairs,' 'scrolled chairs,' and 'turned chairs,' were wrought in ebony, walnut, cherry-tree, &c., with high backs; and either stuffed in one long upright panel, or filled in with wickerwork; the seats being also stuffed, and covered with costly kinds of materials, as various as their shapes. To these may be added low arm-chairs, tastefully turned, and carved in ebony, enriched with ivory knobs and inlayings, chiefly of Italian or Flemish manufacture, with cushions or pillows on the seats. Besides these, there were 'some little gilt chairs for women;' and long seats, with backs and arms, resembling in form the more ancient settle, and holding several persons, were also much in use." (*Hunt's Tudor Architecture*, p. 146.)

2027



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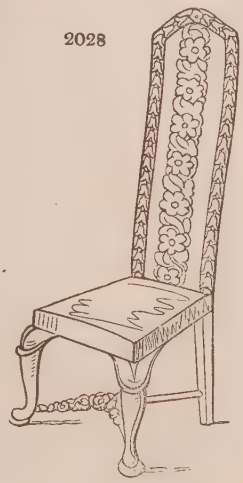


Fig. 2029 is a low arm-chair in the Elizabethan style, contributed by Mr. Shaw; and fig. 2027 is a drawingroom chair, sent us by the same gentleman.

Figs. 2028, 2030, and 2031 are chairs now existing in the neighbourhood of Haslemere, in Surrey, the drawings of which were sent us by Miss Sarah Perry of Stroud House.

2029

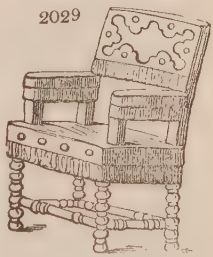
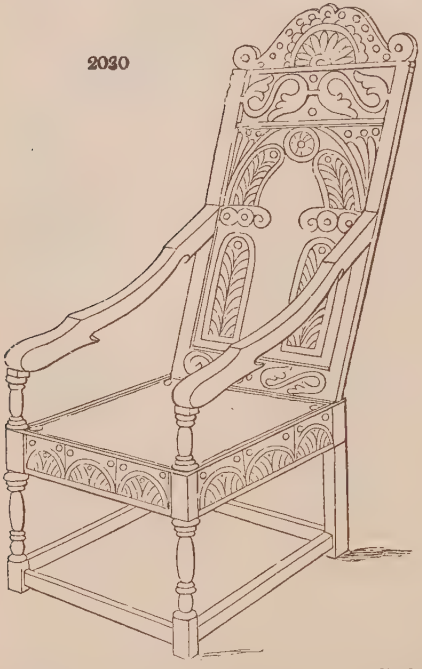


Fig. 2032 is a richly carved Dutch chair, in the possession of a family at Bayswater, from a very beautiful and accurate drawing of which our engraving was made.

Fig. 2033 is an arm-chair and cushion from Hunt, said to be of the time of Henry VIII., and to be now existing. It has nothing to recommend it but its antiquity: the form of the seat is the very reverse of what may be called natural; since, so far from its affording relaxation and ease to the body, the person sitting on it must inevitably be cramped and confined. This is not the only chair or piece of ancient furniture to which similar remarks may be applied. The truth is, that neither in ancient furniture, dress, nor even Architecture, is there any thing to admire, in point of comfort or use when viewed with reference to our own times. There is much of taste and beauty in many parts and articles, considered with reference to their composition; because excellence in art depends more upon the natural talent and exertion of the individual, than on any stores of scientific knowledge left him by his predecessors; and art may, consequently, be carried to a high degree of perfection in an age of general ignorance. Hence, numerous great painters, sculptors and carvers existed in the dark ages, when philosophers and men of science were rarely to be met with: hence, also, while science progressively improves, in consequence of the discoveries handed down from one generation to another, the imaginative arts, in any one age, depend mainly upon the individual exertions of the artists of that age. No natural process of human improvement could produce a Shakspeare; but thousands now know more than Brindley did in his time. We state these facts to show that the admiration which is bestowed on many of the works of art of the dark ages may often proceed from the justest taste, and be neither the admiration of ignorance, nor the mere veneration of antiquity. The finest proofs of this may be obtained from the magnificent work of Seroux d'Agincourt; and also from Perrault, an Architect who, as Mr. Hope finely observes, "knew how to unite philosophy with bricks and mortar."

2030



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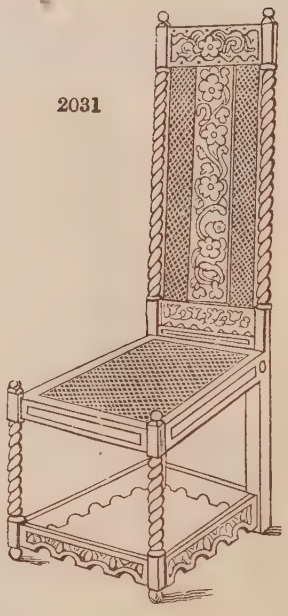
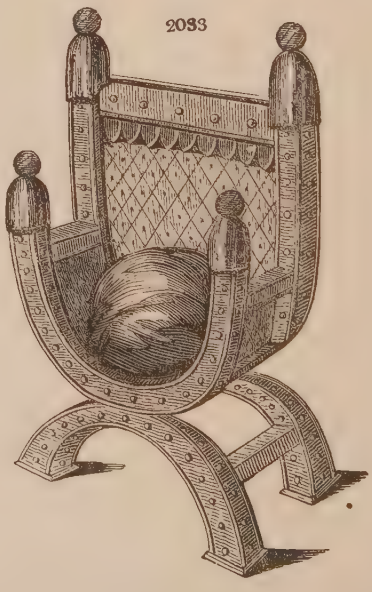


2170. *Tables in the Elizabethan Style* displayed no great variety of form; but the splendour of their coverings, Hunt informs us, "amply compensated for the rudeness

2032

2033

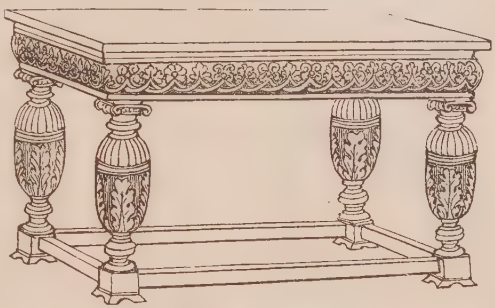


and simplicity of the work so concealed: the most elaborate embroidery wrought on the finest grounds, velvets and satins fringed with gold and silver, Turkey carpets, and the

choicest tapestry were devoted to these purposes." The ornaments, which consisted principally of carving, were chiefly bestowed on the legs and pillars; and of such tables there are numbers to be met with in different ancient houses throughout the country.

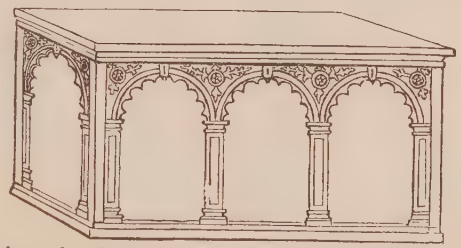
Fig. 2034 is a hall table in this style, designed by Mr. Shaw; and fig. 2035 is a side-board table for a dining-room, by the same artist.

2034



2171. *Cabinets, Coffers, and Chests* are well-known pieces of ancient furniture, and are to be found in every house that has the slightest pretensions to antiquity. Cabinets, Hunt observes, "were of massive proportions, carved in oak, ebony, walnut, and other woods, and sometimes inlaid. Some of these answered the double purpose of depositories and cupboards for plate; and, from having drawers and recesses enclosed by doors, and broad shelves between the tiers of turned columns, were conspicuous objects." (p. 148.) Their exterior appearance often displayed much carving and other decoration, with curious hinges, escutcheons, handles, and angle ornaments. The coffers and chests were covered with iron straps and bands, and had curiously formed locks, hinges, and corner ornaments. For the termination of the strap and hinge bands, the fleur de lis was often resorted to; and the general form and proportion of these ornamented bands of iron were something like those of a sceptre. The handles were of curious workmanship; and sometimes the chest was raised on feet, and at other times on a plinth. Oak was the wood of which these chests were most frequently made, but sometimes they were inlaid with different woods. In all houses in the country, where there are large halls and passages, massive chests are most useful pieces of furniture, for containing articles which it is desirable to conceal; especially lumber or fuel. The exterior of all such chests or wardrobes might be rendered curious, and highly interesting, though we do not say in correct or architectural taste, by covering them with the Elizabethan, Dutch, Louis XIV., or Francis I., ornaments, which are now to be purchased in abundance, either at home or abroad. We have already, § 2063, referred to Nixon and Son, for the two latter kinds of furniture; and we may here observe that Wilkinson of Oxford Street, and Hanson of John Street, have extensive collections of Elizabethan and Dutch furniture and carvings, from which a judicious compiler of exteriors might clothe skeleton frames, so as to produce objects of curiosity and interest, at a very trifling expense. Kensett of Mortimer Street has also some curious specimens both of Elizabethan and more ancient furniture. Among these, we may mention a correct fac-simile of a chair taken from Tintern Abbey, and now in Troy House, Monmouthshire; and two other chairs from Glastonbury; one of which, called the abbot's chair, is of very elaborate workmanship, and the other no less remarkable for the simplicity of its construction. Correct copies of these celebrated chairs are manufactured by Mr. Kensett for sale. A fine specimen of the manner of fitting up a room with Elizabethan fragments may be seen in Mortimer Street, at the office of Mr. Fairs, a London house-painter of the very first taste.

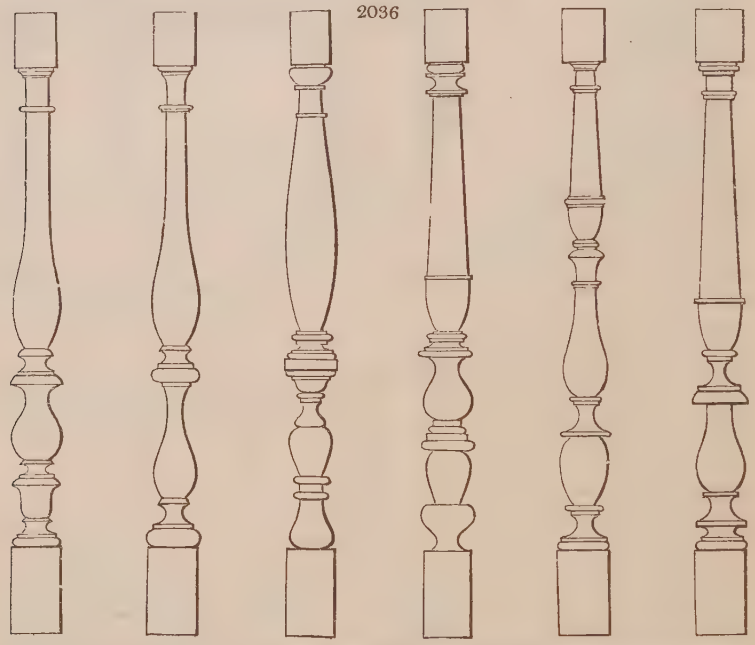
2035



2172. *Bedsteads, and the other Articles of Furniture in Bed-rooms, fitted up in the Elizabethan Style*, were curiously wrought and carved. The wood was generally oak or chestnut; but walnut, elm, holly, and box were used, painted more or less, and sometimes profusely gilt. It does not appear that curtains formed so important a part of the ancient bed as they do of the modern one. The chief expense seems to have been incurred in carving the posts; in the head-boards, which extended from the pillow to the canopy; in the canopies themselves; and in the deep cornices, or rather architraves, which surrounded the whole. In designing modern beds in this style, the artist should bear

in mind, not merely the great cost of such carving relatively to the effect produced, but also that this kind of ornament is more apt to harbour dust, and that it is more difficult to clean, than any other. This also is an argument against the extensive use of the highly enriched Gothic style. In an age like the present when all, from the highest to the lowest, are beginning to recognise their equal natural right of enjoyment, it will soon become a part of the business of Architects and upholsterers to design and prepare articles of furniture, both for use and luxury, in such a style, as will reduce the labour of servants, in keeping them in order, to a minimum. Fig. 2036 exhibits six Designs

2036

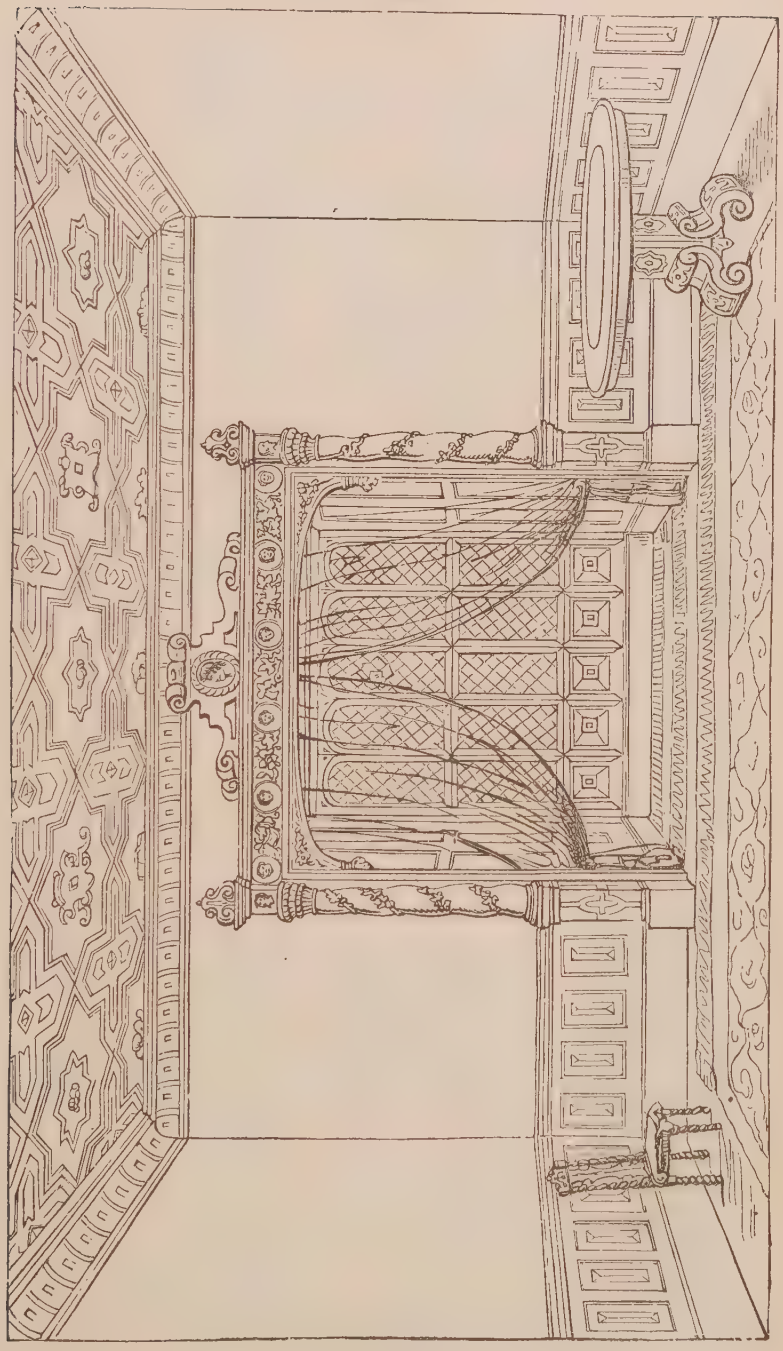


for balusters, selected, by Mr. Varden, from old specimens, which at once afford hints for bed-posts, staircase railings, backs to settles and to chairs, and open screens. It is almost needless to add that all these forms might be enriched by carving; or that they are in any thing but good taste when considered with reference to abstract principles.

2173. *Interiors in the Elizabethan Style.* Fig. 2037 is a general view of a dining-room; and fig. 2038 that of a drawingroom: both are by Mr. Lamb.

2174. *Remarks.* Much more might have been said on the subject of Elizabethan furniture, and it would have been easy to give numerous designs: it must, however, be recollected that our object, in this work, is, not to display antiquarian lore, or articles which would require enormous expense to execute, but simply to give an idea of the style of composition known as Elizabethan, and to show how it may be applied to articles in modern use. No one ought to attempt it who is not a master of composition on abstract principles; but, indeed (in London, at least), the attempt is scarcely necessary; since there are abundant remains of every kind of Elizabethan furniture to be purchased of collectors. These, when in fragments, are put together, and made up into every article of furniture now in use; and, as London has a direct and cheap communication with every part of the world by sea, the American citizen or the Australian merchant, who wishes to indulge in this taste, may do it with the greatest ease, and may purchase real antiques at much less expense than he could have the articles carved by modern artists. To those who wish to study the furniture and furnishing of the times of Elizabeth and James, we recommend Mr. Hunt's very excellent and entertaining work on *Tudor Architecture and Furniture*: and "the antiquary, who desires a perfect idea of any article of furniture mentioned by Froissart, Chaucer, or Shakspeare; the Architect, who wishes for standard authorities for the restoration or imitation of ancient buildings; the painter, who is anxious to produce a historical picture which shall challenge the most fastidious criticism; or the histrionic manager, who is ambitious, in scenery, to rival John Kemble's correctness in costume," we refer to Shaw's *Designs for Ancient Furniture.*

2037



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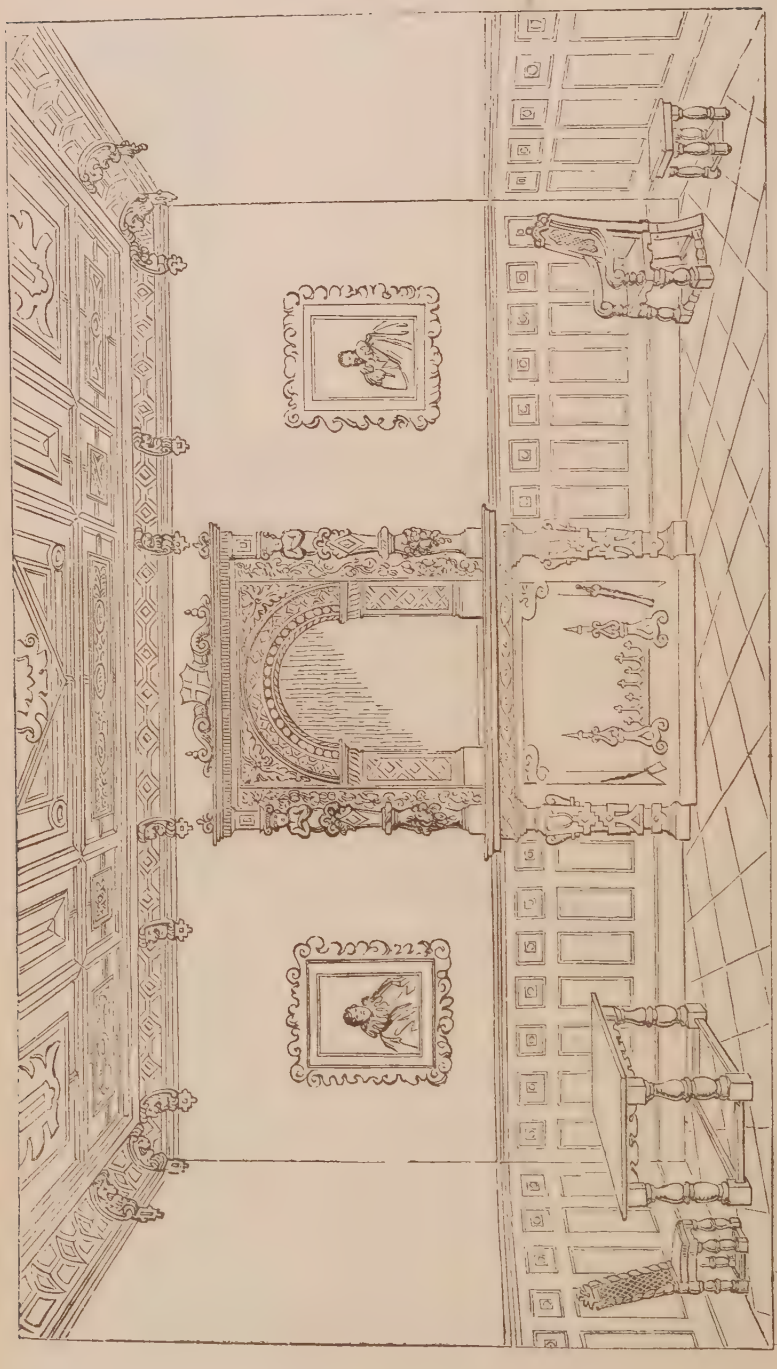


BOOK IV.

THE PRINCIPLES OF CRITICISM IN ARCHITECTURE.

2175. *The Principles of Criticism*, in any art, are nothing more than the principles on which that art is founded. They are termed principles of criticism by those who consider themselves judges, merely with reference to their application to the productions of art, when a judgment is to be expressed upon those productions. Every person who forms an opinion of, or passes his judgment upon, any work of art or literature, must do so with reference to some previously received ideas; and these ideas, whether well founded or not, are to him at once his scientific principles of the art which forms the subject of his opinion, and his principles for criticising that art. This is one reason for the very different opinions formed of works of art by critics: but another reason, and one perhaps more powerful, arises from the difference in the natural susceptibility of men's minds to the impression of beauty; in other words, from the original difference between men in those perceptive powers, which, when united, constitute what is called the faculty of taste. It is evident, therefore, that the principal causes of the differences of opinion which exist among critics are their different degrees of knowledge of the first principles of the art to be criticised; and their different degrees of natural taste for its various productions.

2176. *The Productions of any Art* may be examined in two ways: first, with reference to what they are in themselves; and, secondly, with reference to what the artist intended to make them. In the one case, the effect of the object, or the pleasure or dissatisfaction which it occasions, is analysed, and referred to first principles, without the critic having had any previous knowledge of the intention of the artist; and, in the other case, the design or intention of the artist being known, the beauties or effects which ought to be the result of that design, are sought for in his production, which will be blamed or praised according as these may be found present or wanting. The first mode of criticism may be called analytical; and the second, synthetical. Both equally suppose in the mind of the critic a knowledge of the principles of art, and the power of applying those principles to its productions.

2177. *The Criticisms in the preceding Part of this Work* have been chiefly analytical; and they have, in few instances, embraced either the whole of the merits, or of the demerits, of any one particular design. The reason is, that our object, as expressed in the Introduction (p. 1.), was, to develope principles, "as it were, incidentally, and by little and little;" with a view first to excite, and afterwards gradually to increase, a taste for the study of Architecture, in minds which had previously paid but little attention to the subject. We trust that the reader has borne constantly in his mind, while perusing the preceding pages, that such has been our intention; for, unless this has been the case, those who were previously masters of the subject must have been surprised to find that we have sometimes passed over both faults and beauties without notice. All this, however, was the necessary consequence of the plan which we laid down as our guide when we set out. As the result of that plan, we hope we may conclude that the causes which we have assigned for the beauties and defects of the designs given, have, by this time, impressed on the minds of our readers all the leading principles of Domestic Architecture as an art of design and taste.

2178. *The Object of the present Book* is to collect, and to present in a systematic form, those leading principles of architectural criticism which have been scattered throughout the work; as well to show the reader their relative importance, as to afford him an easy means of comprehending them as a whole, and of storing them up in his mind. By finding here collected together, and connected by the relation which they bear towards one another, those principles which he had before become acquainted with separately and incidentally, their repetition, when thus combined, will reiterate the impression they had already made on his memory, and will enable him, if he should re-examine our designs, to complete those criticisms which we have only commenced; or, should he direct his attention to the designs of others, to detect in them whatever faults or beauties they may happen to possess. The use of the present work, in improving Domestic Architecture in Britain, America, and Australia, will materially depend on its rendering the reading classes architectural critics; and more especially on the influence which it has, in this respect, in improving the taste of women. The Designs we have given will, no doubt, be of essential service as models; but the grand and permanent effect of this work must depend on the spirit of observation and inquiry which it excites in the general reader. We have stated, in our Introduction, that the principles of Domestic Architecture as an art of design and taste, may be reduced to three: viz., fitness for the end in view; expression of the end in view; and, expression of architectural style. To each of these principles we shall devote a short chapter.

Chap. I.

Of the Principle of Fitness, as applied to Architecture.

2179. *The Subject of Fitness, in Architecture*, naturally embraces the fitness of the plan, or arrangement, of the building for its uses; the fitness of its construction for strength and durability, and the adjustment of the whole design to the pecuniary means employed.

2180. *The Fitness of the Arrangement of a Design* for the uses for which it is intended must necessarily depend on the knowledge which the Architect possesses of those uses. The purposes for which buildings are erected are so various, that it is not to be expected they can be all equally known to any one individual: nevertheless, the Architect must be supposed to understand the uses of whatever building he undertakes to design; for, otherwise, we cannot with justice examine his works by fitness for the end in view, as a principle. All buildings may be arranged under certain classes; such as, human dwellings, lodging-places for animals, and buildings for carrying on trades or manufactures, for public assemblies, for public instruction, for the purposes of the administration of the laws, &c. The first class mentioned (that of human dwellings) may be subdivided into orders; such as, villas, farm-houses, cottages, &c., according to the different habits or modes of living of the persons by whom they are to be occupied. The second class of buildings (lodging-places for animals) may be divided in a similar manner, according to the kind of animals that are to be lodged in them. The same may be said of the class of buildings for carrying on trades and manufactures, which may be divided into an almost endless number of orders, according to the respective arts or manufactures to which they are adapted. Public buildings will admit of a still greater number of divisions; but, without attempting to enumerate them, the classification already mentioned will sufficiently show the great extent embraced by the subject of architectural design; and how unlikely it is that any one Architect can be equally conversant with the principle of fitness, as far as regards design or intention, in every order of buildings. If we even take human dwellings, we shall probably find that the Architect is only master of the subject of fitness for that description of dwelling in which he has been used to live, or which he has been accustomed to construct. In proof of this, we may refer to most of the books of designs by Architects for cottage dwellings and farm buildings which have hitherto appeared; and to the remark made by one of our correspondents, on this subject, at the conclusion of § 1368. In like manner, the Architect's powers of design, in contriving houses for lodging animals, will depend on the knowledge that he has of those animals, and of their uses to man; and thus, though most Architects may design a stable, with which every one is familiar, yet those whose practice has been chiefly confined to towns, and who may excel in designing street buildings for either men or animals, may yet know very little of the requisites for a dairy, a poultry-house, or even a pigsty. Hence it may be affirmed that, as far as respects design or intention with reference to use, no persons can be so competent to point out the arrangement of a building, as those who use, or whose business it is to direct the use of, such buildings; provided such persons are sufficiently enlightened on the subject to be able to conceive improvements, and have the power of conveying their ideas to others. It does not follow from this, however, that no Architect should undertake to design a building with the uses of which he is not previously familiar; but it does follow, that, when employed in such a case, he should endeavour by every means in his power to make himself master of those uses. Among the principal of these means, after referring to books, will be found consultation with the user, or party for whom the building is to be erected. From these observations three conclusions may be drawn: first, that all those buildings which are not of frequent and general construction by Architects are more likely to be imperfect in arrangement than those which are continually being erected by them; secondly, that a division of labour among Architects, by which each would devote himself solely to some particular branch of his profession, is a very natural, and would be a very desirable, arrangement; and, thirdly, that very few architectural critics can be supposed to be competent to judge of a building with reference to the most important point connected with it; viz., its fitness for the use in view.

2181. *The Fitness of the Construction for Strength, Durability, and the pecuniary Means at the Command of the Architect*, involves in it a variety of considerations; but the qualifications for this department may be all acquired by any individual who devotes himself to Architecture as a profession. The strength of a building depends chiefly on the disposition of the materials; and its durability on their nature, or chemical composition. The fundamental principle on which all construction, which has for its object strength, is founded, is the law of the gravitation of materials; or, in mathematical language, the law of motion. From this law has been deduced the problem of the composition and

resolution of forces, by which every point relative to the strength of a building may be tested. This problem was first given to the English reader by Emerson, in his *Mechanics*, and will be found familiarly explained to the young Architect in Tredgold's *Carpentry*, Gwilt's *Rudiments*, and other works. The practical object of the problem is, to enable the builder to determine, with ease and absolute certainty, what parts of construction, whether of timber, stone, iron, or walling, act as ties, or binding parts; and what as struts, or parts supporting weight; and what is the proportion or amount of tension or pressure on each. Much of the strength of all modern buildings, of several stories, depends on the walls being tied together by the different floors, and by the roof. Deprive the walls of the greater number of the dwelling-houses in the principal towns in Britain of these sources of strength, and they would be blown down by the first storm of wind which occurred, notwithstanding the durable nature of their materials. The durability of a building, no doubt, depends, in part, on its construction: but, essentially and principally, it depends on the durability of the materials of which it is composed; and the tests for ascertaining this durability are derived from the principles of chemistry, and chiefly from the law of attraction. A very strong construction may be formed of timber; but the duration of such an edifice could never be put in competition with that of one built of bricks or stones, united by mortar or cement. From the preceding observations on strength and durability, are drawn the following well known practical precepts: viz., to have solid and secure foundations; to use materials of the best quality: to dispose of them in a manner suitable to their natures; and, to employ only the best workmanship. The following observations are illustrative of some of these precepts.

2182. *The Strength of Building Materials*, such as timber, brick, stone, iron, &c., may readily be ascertained by subjecting them to pressure, tension, and torsion, by mechanical means, or by loading them with weights.

2183. *The Durability of Building Materials* is more commonly ascertained from the previous experience of builders, than by experiments made on scientific principles; nevertheless, there are some geological facts, relative to the stratification of rocks, which ought to influence the builder as to the position in which stones taken from such rocks ought to be placed in walls; and there are some chemical facts, relative to the decomposition of the integral particles of stone, from which conclusions may be drawn as to its durability, previously to its being applied. The stones, or earths, which, when reduced to powder, are made into mortars, or cements, may always be subjected to experiments, so as to prove their value before employing them. With regard to timber, there are compositions which have been applied to it for the purpose of increasing its natural durability, and others for rendering it less destructible by fire.

2184. *All stratified Stones used in Walls* should have the plane of their layers or laminæ declining towards the outside of the wall; or, at all events, placed horizontally. The object of this position is, to present the edges of the laminæ to the action of the weather, and not their broad surfaces. There are some exceptions to this rule; but they are so few as not to require notice. When the face of the laminæ forms the surface of the wall, the water which runs down it after rains, sinks into the interstice between the outside lamina and the next to it; and in time, with the aid of frost, causes the outside surface to scale off: and this process many times repeated, will at last so far destroy the stone, as to undermine the superincumbent parts of the wall. On the other hand, when the edges of the laminæ are presented to the action of the weather horizontally, and rather declining outwards, though the rain-water will still enter between them, yet, as it cannot penetrate far horizontally, the injury done by it will be comparatively trifling.

2185. *Brand's Test for ascertaining the probable Action of Weather on Building Stone* is as follows: — Boil two one-inch cubes of the stone to be tried, in a solution of sulphate of soda saturated at a common temperature, for half an hour: then expose the cubes to the air for evaporation. The salt crystallises, and has the effect of freezing on the stone. Then dip the stone in the cold solution until the crystals fall. After this, expose the stones to the air. This experiment repeated, during five days, will produce the same effect on the stone which exposure to the open air would do in many years. (*Lit. Gaz.* for 1829, p. 633.)

2186. *The Art of mixing Earths so as to form Mortars* which will set, or solidify, either by themselves, or in conjunction with stones or bricks, can only be scientifically understood through some knowledge of chemistry. All lime mortars depend for their strength on their quality of absorbing carbonic acid gas and water, and solidifying them. All cements, or rapidly solidifying mortars, though they depend for their strength on the same qualities as lime mortar, owe their power of rapid solidification to the presence of some metallic oxide, the value of which principally results from its capacity for absorbing oxygen.

2187. *The Solidity of Walls* depends on their homogeneousness, on the position of

their materials relatively to the centre of gravity, and on the stability and security of their foundations. The most durable of all walls are those built of brick with good mortar, because they attain a degree of homogeneousness which no construction of mortar and stone has ever yet equalled. The proof of this is to be found in the ancient brick buildings of Italy. The walls next in durability are those formed of fragments of porous stone, compactly bedded in good mortar or cement; as in the remains of old Roman castles in Britain and in Germany. The third in order are those (commonly reckoned the first) which are composed of very large blocks of squared stone, and the strength of which does not at all depend on mortar or cements of any kind.

2188. *To preserve Timber in Buildings from Decay*, the most certain means are so to dispose it, as that it shall have efficient ventilation: but other methods have also been employed. Among these are, steeping the timber, previously to use, in water, and afterwards drying it in the air; subjecting it to the action of steam, and afterwards drying it; removing the atmospheric pressure, and at the same time applying artificial heat, so as to promote evaporation; or steeping it in a solution of corrosive sublimate, which is now found the most efficient remedy, next to ventilation, for what is called the dry rot. The object of all these operations, except the last, is, to remove, by extraction and evaporation, what is called the sap, or the watery part of the alburnum, or last-formed layers of the wood, which are found to decay sooner than the interior and firmer, or less porous, layers; and the object of the last process is, to saturate the sap wood with a poison, which, combining with the alburnum, will prevent its being attacked either by insects, or by those fungi which identify themselves with decay. According to Mr. Kyan, who has taken out a patent for preventing the dry-rot in timber, cloth, and a variety of other articles, by steeping them in a saturated solution of corrosive sublimate, oak, fir, and other woods, absorb about the same quantity of the solution; viz., five ounces for 216 cubical inches, the cost of which is a mere trifle. A fir deal will take in a sufficient quantity to saturate it in forty-eight hours; but an oak beam will require a month. Canvass, leather, &c., may be completely saturated in an hour or two. It is thought that the outside wood, at present cut off as useless, the timber of young trees, and the soft woods, such as poplar, American pine, &c., may by this means be rendered as durable as the harder woods, and as heart wood. (See *Quart. Rev.*, vol. xlix. p. 125.)

2189. *To lessen the Destructibility of Buildings by Fire* is an important part of the practice of construction; and one which ought never to be lost sight of by the architectural critic. No building can be completely fire-proof, into which timber enters as a component part; but this timber may in some degree be made to resist fire, by saturation with sulphate of iron: and fire can always be prevented from spreading in a building, by having all the partition walls solid, the interior of them being filled up with brick, stone, or mud; and by having all the floors of stone, brick, or some earthy composition. Where the floors are of timber, coatings of mortar may be introduced under the boards of the flooring between the joists, in the manner invented by Lord Stanhope, and described in the *Annua Register*, vol. xxii. Linings of sheet iron may also be applied between floors and ceilings, and in the middle of partitions; the panels of doors may be formed of sheet iron, or of corrugated iron, for the same purpose. In all dwelling-houses, where it is an object to guard against danger to life from fire, there ought to be stone staircases, and a balcony to at least one of the windows of each story above the ground floor, to afford means of escape. All houses of several stories ought to have the staircase continued to the roof, not only to admit of easy escape in that direction in case of fire, but to afford ready access to the chimneys when on fire, or when they may require sweeping; and also for general repairs. As Mr. Kyan's composition by neutralising the albumen of woods, destroys the fermentative principle, and thus prevents decay, by putrefaction or rot; so, at no distant period, the discovery may be made of some solution of silex, or of some other earth or metal for saturating timber, &c., and thus rendering buildings of common construction indestructible by fire. Such a discovery, added to that of the means of preventing the dry rot, would prove of incalculable benefit to mankind, by diminishing the expense and increaing the durability of the dwellings of the humblest classes, in every part of the world. The architectural critic should be alive to all improvements of such general application, whether realised or anticipated.

2190. *To guard against the effects of lightning.* The use of lightning conductors is well known. They are commonly made of iron rods, pointed at the upper end, higher than the highest part of the building to which they are attached, and having the lower end inserted in the earth; the rod following the outline of the building from the highest part to the ground, and being prevented from touching it by glass studs. A more improved form, however, has been introduced by a distinguished philosopher, John Murray, Esq., who has paid the greatest attention to this subject, both theoretically and practically. The following is a description by this gentleman, of a conductor, constructed and attached to St. Paul's church, Huddersfield, in 1831, under his directions. "This con-

ductor," says Mr. Murray, "is altogether unique, and without its counterpart in Europe, as far as I know. It is constructed on principles deduced by me not merely from electrical phenomena developed by artificial experiments, but from repeated and careful inspection of the effects of lightning. It consists of copper gas-piping in lengths of about ten feet, screwed into sockets. The conductor terminates at the summit, in a pyramidal form, inserted by a joint into the hollow pipe; the lightning therefore finds a ready entrance, not only by the sharp point, but by the angles of the copper pyramid. The pipe immediately beneath this joint is perforated, so that the lightning may be diffused over both surfaces, internal as well as external, and the facilities of escape to the earth will be further increased by the wet that penetrates the tube during the rain which falls during the storm. This lightning rod is secured from oxidation by ribands of zinc attached at specific distances, which operate on galvanic principles; and the conductor, thus constructed, enters the earth at a slight angle, and terminates in a stone trough, which will be supplied with sufficient moisture by the pipe. Here it is split in two, and its ramifications pass over the edge of the tank into the subsoil. Perhaps this conductor is not only the cheapest but the best ever constructed. The first, because, from a hollow pipe being employed, the weight of the copper, and consequently the expense, is materially diminished; and the second, because in these conditions all the principles of security are provided. Copper is the *best* conductor of lightning, and, as lightning does not penetrate a good conductor to any appreciable depth, an extensive and an ample conducting surface is provided, and facilities both for its reception and final transfer to the earth fully supplied. Add to these, last not least, in the train of securities, there is no interruption whatever, from beginning to end, in the channel by which it descends from its elevation. A conductor on these principles has also been attached to a private house in the vicinity of Huddersfield."

2191. *The Construction of Fireplaces and Chimney-flues* in dwelling-houses is still very imperfectly understood; very little having been added to our stock of knowledge on this subject since Franklin's *Letter*, &c., was written in 1785; or Count Rumford's *Essays*, a few years afterwards. The principal requisites to insure the draught of a chimney appear to be, a considerable height in the flue, such a construction at the fire-place as will allow as small a quantity as possible of air which has not passed through the fire to ascend the chimney, and a free supply of external air to the room in which the fire burns. This supply should be obtained directly from the exterior atmosphere, either by having the windows not to fit too tightly, by letting down the upper sash at the top, or by having a tube of several inches in diameter, from underneath the fire-grate to an under-ground drain of ample dimensions. Clavering, Chadley, and Hiort agree in recommending circular or oval flues, as being more suitable to the motion of the smoke, and being more easily cleaned, than square ones. They also agree in recommending a zigzag or bending direction for flues, as preventing the wind from blowing down the smoke by the resistance offered by the bends; and, according to Chadley, even improving the draught, which, it appears to us, they can only do, by producing a greater quantity of heated material in the sides of the flue, in proportion to its direct vertical height, than can be done in a flue carried up straight. It may also be observed, that the smoke, in a perpendicular flue, ascends in a column composed as it were of straight lines, like water running along a straight brook; whereas, in a circuitous or zigzag flue, it ascends in curved lines, or curls, or what may be called eddies, like water in circuitous brooks. In the first case, it is evident that the wind, striking down on the smoke, when it escapes the top of the flue, would produce such a pulsation as would force it out into the room; whereas, in the other case, the force of the stroke of the wind would have to counteract all the different eddies, before the pulsation could reach the fireplace. In general, by attending to these desiderata, those unsightly objects, chimney-pots, may be avoided; and indeed, our opinion is, that every one who employs an Architect or builder ought to engage with him, under a heavy penalty in case of failure, to arrange his design and its execution in such a manner that no chimney-pots shall ever become requisite. Thick walls for containing the chimney-flues, and for keeping them warm; placing these flues as much as possible in the interior walls; having lofty and winding flues, circular or oval in their section; and having a supply of air to every hearth, or the back part of every fireplace, from air drains of large capacity, seem to us to be the principal means of insuring bright fires and freedom from smoke. Such fireplaces as Methley's and Silvester's are also eminently favourable for this end. Methley's fireplaces, by having the breast or upper part beveled downwards towards the fire, not only greatly diminish the quantity of cold air which enters what is called the throat of the chimney; but, this beveled space being of metal, must necessarily raise the temperature of such air as does enter. In short, we do not know of any form of fireplace so well calculated for preventing a chimney from smoking, unless indeed it be that of Sylvester, fig. 1844, of which, however, we have only had a few weeks' experience;

whereas we have proved Methley's fireplace, fig. 1843, for nearly six years. Circular flues might readily be built, in a winding or zigzag direction, perfectly smooth in the inside, and at a comparatively small expense, by using sections of earthenware pipes as suggested, § 463; and, to render the walls containing such flues perfectly strong, they might be built with mortar of a superior description, or with Roman cement. A peculiar form of bricks for this purpose has been invented by Hiort, but they are found much too expensive; another and a very superior kind, which, from their shape, have the great advantage of bonding in with the wall, have been invented by Chadley, and deserve to come into general use. However, were Roman cement used in building the walls containing flues, whether these walls were constructed of brick or stone, flues might easily be formed circular in the section, and with perfect strength, by carrying them up round a flexible mould, or leathern bag filled with sand, drawn up the flue as it proceeded. One great use of circular flues is, that whatever may be their direction, they are easily swept without the aid of climbing boys. About London, where houses are almost always built on ground only held on lease for sixty or a hundred years, the thick walls containing the flues are generally the weakest in the building, instead of being, as they ought to be, the strongest; and hence the great danger which exists, not only of their tumbling down, but of their being penetrated by fire. Were such walls built with Roman cement, though hollow, they would be as strong and perhaps stronger than if they were solid. Nothing is more to be desired than that some mode of constructing flues should be generally adopted, which would render climbing boys unnecessary; and this, the government might easily effect in all houses to be built, with very little additional expense to the builder, by enacting that all flues should be built circular, and be perfectly smooth inside. This is a point which, we have no doubt, will be attended to as it deserves, by the public, in a very short time; and, when this is the case (as with every thing else which the public decidedly wills), it will become law. It is well known that (all other circumstances being the same) the short chimney flues of garrets and cottages never draw so well as those of rooms which have very high chimneys. This is an undeniable fact; it was noticed by Franklin; and, as it concerns servants and poor people in every part of the world, it merits the particular attention of the Architect. How is the imperfect draught of short chimneys to be remedied? On the same general principles which we have laid down; viz., increasing the height of the chimney as much as possible (which is the reason why we have shown such high chimneys to most of our designs for cottages); adjusting the throat of the chimney to the quantity of air and smoke required to make the fire burn properly; forming one or more bends in the flue, to prevent the smoke from being driven down by the wind, and to increase the draught (which has the additional advantage of preventing the rain from falling down perpendicularly, and carrying the soot before it); but, above all things, by having an opening at the tops of the windows or near the ceiling, in each apartment, for the admission of external air to supply the draught. It may be laid down as an indisputable fact, that it is impossible to have all the doors and windows of an apartment very tightly fitted, and at the same time to have the fireplace draw well, without the addition of such openings as have been mentioned, or of an underground air flue, and a communication between it and the hearth. As this would occasion too much trouble and nicety in the construction of common cottages, nothing remains in the case of such dwellings, but to provide openings close under the roof, or over one door or window in each apartment, for a sufficient supply of external air. These openings may be furnished with shutters so as to regulate them at pleasure; but, as even this might be too much trouble to a common cottager, the simplest mode is for him to push down the upper sash of his window an inch or two, or to open his outer door to the same extent. The whole of this subject merits the attentive consideration of the architectural critic; who will find, that, in proportion to the perfection of the fitting and finishing of doors and windows, in the same proportion is the risk created of having smoky chimneys.

2192. *Ventilation* is a subject intimately connected with that of the preceding paragraph. The perfection of ventilation consists, not in suddenly expelling the air from an apartment, and supplying its place with external air; but in first gradually mixing the external air with that of the apartment to be ventilated, and next in carrying off this mixture by degrees, and supplying, by degrees, a fresh mixture in its place. When warm air is to be mixed with cold air, the latter ought to be admitted from above, in order that it may descend, and intermingle with the former: on the contrary, when cold air is to be mixed with warm air, the latter ought to be admitted from below to intermingle with the cold air in ascending. Hence, for the first purpose, the best practical mode of ventilating a room is to have all the windows carried up as close to the ceiling as is practicable; and, when the air of the room is to be cooled, simply to slide down the upper sash of the window or windows, for a very small space, which, in few rooms, need exceed an inch for each window. When the air of a room is colder than the external air, and

is to be warmed by its admission, then the lower sash of the window ought to be raised up; but as this description of ventilation is seldom required, little need be said about it, farther than observing that when any material, such as a coil of steam or hot-water pipes, &c., in a room, is to be heated in order to increase the temperature of that room, the heated body ought to be placed on the floor, or as near to it as possible. In like manner, when a room is to be heated by the admission of heated air from a stove, that air ought to enter through the floor, or by the skirting or bottom part of the walls. The most convenient means for carrying off the air of the room, so as to induce a perpetual current of entering and escaping air, is the chimney; for which purpose, it is desirable that the chimney breast should be somewhat higher than it generally is. As a high chimney breast is, however, inconsistent with a good draught, and with the throwing out of a maximum of heat from a given quantity of fuel, builders generally content themselves with leaving this part of ventilation imperfect; though they might remedy it by taking the trouble of forming openings close under the ceiling of the room, communicating with vertical air flues, placed in close contact with smoke flues, in order to create a draught. This last improvement comprehends all that is necessary, for the most perfect ventilation of a room which can be conceived; as a proof of which, we need only refer to Mr. Tredgold's excellent treatise on the subjects of warming and ventilation, already mentioned.

2193. *The Deafening, or Pugging, of Partition Walls, and of Floors in Houses of more than one Story*, is a subject that the critic ought not to lose sight of, in judging of the fitness of the construction of a house for the end in view. There are two modes of effecting this object; first, by filling the interstices between the joists of the floor, and the quartering or studwork of the partition, with some description of light material, such as sawdust, wool, charcoal, ashes, moss, or even earth; and, secondly, by introducing interpartitions. The latter mode is by far the best, where lightness is the object; and where it is necessary to preserve ventilation, in order to guard against the dry rot. This mode is also fully as efficacious against the spread of fire as the former. Supposing a floor to be deafened in this way, the mode is, after the joists are laid down and fixed in their places, to nail slips of wood an inch square along their sides, within two inches of the bottom, and within three inches of the top. On these slips are laid short laths, which are afterwards plastered on each side, care being taken that the coats of plaster are not thicker than to leave a clear inch and a half between them and the lower and upper edges of the joists. When the boards of the floor are nailed to such joists above, and the lath and plaster of the ceiling is put on below, a section across the joists will show, between each pair, one large cell in the centre, and two long narrow cells, the one over the centre cell, and immediately under the boards of the floor, and the other under the centre cell, and immediately over the lath and plaster of the ceiling. Through such a floor no ordinary sounds will be found to pass, whether to persons above from people talking in the room below, or to persons below from any one walking on the floor above. Partitions may be treated in the same manner; but, in general, one vertical stratum of lath and plaster in the centre will be found sufficient. In extraordinary cases, two will render a partition wall of nine inches thick as impenetrable by sound, as a solid brick or stone wall of the same thickness. It must not be forgotten, that these measures for preventing the spread of sound are known to be equally effective in preventing the spread of fire; while, at the same time, they admit of complete ventilation to protect the timber of the partitions and floors from the dry rot. — Such are a few of the particulars which the architectural critic ought to attend to, in judging of the fitness of the construction of a dwelling-house for the end in view; for a great many others, as well for dwelling-houses as for agricultural and other buildings, we must refer him to the three preceding Books of this work.

2194. *The Adjustment of the Construction of a Building to the pecuniary Means at the Command of the Architect* supposes an intimate practical knowledge, in the latter, of the most advantageous manner of disposing of forms and quantities. Every architectural critic ought to know that the cube is a form that encloses more useful space, with a given quantity of walling, flooring, and roof, than any other. This was long ago explained at great length, and applied to the designs of a number of dwellings, by Morris, an architectural writer of the last century: but a short extract from Gwilt's *Rudiments* will be sufficient for our purpose here. "Suppose a square, the sides of which are forty feet in length: it is manifest that the walling required to enclose this figure will be 160 feet in length, and the area enclosed will be equal to 1600 square feet: whereas, in a building, the form of which, on the plan, is that of a parallelogram, and the opposite sides of which are sixty feet and twenty feet respectively; the same quantity of walling will be required to enclose it, as was necessary for the square; though its area will be equal to only 1200 feet, or one fourth less than that of the square. Thus the square is proved to be superior to the parallelogram, though inferior in capacity to the circle.

Hence edifices in which the greatest symmetry exists are invariably (other circumstances being the same) of the least cost; and hence, also, simplicity and regularity in the general plan and its parts are always conducive to economy." (Gwilt's *Rudiments of Architecture*, p. 6.) Though this knowledge can never enable an architectural critic to discover whether the Architect has solved the problem of erecting the desired building for the given sum; yet it will enable him to judge, from external appearances, of the comparative expense of buildings. He may also deduce from it this rule; viz., that, when economy is the main object, the parallelogram form should never be preferred to that of the cube, except in those cases in which the diameter of the cube would be so great, as to prevent the proper admission of light and ventilation to the interior parts.

Chap. II.

Of the Expression of the End in View, in Architecture.

2195. *The Expression of the End in View* comprehends the expression of the use for which the building was erected, and the expression of a suitable construction for that end. Every building should appear to be what it is, and every part of an edifice ought to indicate externally its particular use. When we are satisfied that we have discovered the use of any building, or the intentions of the Architect in this respect, the next thing which we enquire is, how far he has succeeded in carrying his intentions into effect; that is, whether the expression of the construction which he has adopted is in accordance with the expression of the use. To give a familiar example: suppose a building, the expression of which was that of a stable, and that the entrance to it was up steps. In this case, the expression of construction would be decidedly at variance with that of use.

2196. *That which constitutes the Expression of Use or Purpose, in the Exterior of a Building*, must be some quality which we have been accustomed to associate with that use or purpose. It follows, therefore, that all the various uses of buildings and their different parts must be understood by the critic, before he can judge whether the uses of those parts are properly expressed. As this is equally as impossible, with respect to all buildings, as that an architectural critic should always understand what constitutes fitness for the end in view; it follows, that his judgment in this particular, as in various others, must often be imperfect. Every one has some idea of what constitutes expression of purpose, in the common dwelling-houses of the country in which he lives; but no person, who was not either an agricultural Architect, or familiar with agricultural buildings, could recognise the expression of purpose in the separate buildings of a farmery; nor could any one who was not well acquainted with the appearance of manufactories, or was not a constructor of them or of their machinery, expect to do this with reference to the buildings in which manufactures are carried on. Still, the architectural critic may acquire sufficient information on the general uses of all the classes of buildings constructed in the country in which he lives, or described in books, to enable him to judge of their general expression.

2197. *The Expression of Suitableness of Construction* supposes a knowledge of what constitutes strength and durability in buildings; a kind of knowledge which, as we have already observed, is much more within the power of either Architects, or architectural critics, than a knowledge of the uses of buildings. In illustration of these two principles, we shall subjoin a few remarks.

2198. *In Dwelling-houses*, the expression of use is indicated, in a decided manner, in all cold countries, by their having a number of chimney tops, or other outlets, for permitting the escape of smoke from separate fires. In all countries whatever, a dwelling-house is indicated by its windows, and by their being filled in with glass, more or less, according to the nature of the climate and the character of the dwelling. A dwelling-house is also known by its entrance door, which is generally ascended to by steps; a proof that it is not a door for any of the inferior animals, or for taking in and out heavy articles in use in agriculture, trade, or manufactures. These are general features of expression, of which there are many shades; but there are also a number of particular features, indicative of the different apartments contained in the house, and of the style of living of the occupants. In a cottage of the smallest size, having a living-room, a bed-room, and a closet, the windows to each of these will be of different dimensions; the largest window will at once be recognised as that lighting the living-room, and the smallest as that belonging to the closet. In dwellings of larger dimensions, the windows of the different living-rooms will or should be formed, not only larger than the others, but occupying what, in the given country and locality, is considered the principal floor of the house. Large windows, with considerable space on each side

and over them, indicate wide and lofty apartments within; whereas numerous small windows, with narrow piers between them, and small spaces over them, indicate numerous small and low apartments, or apartments extending in length, but not in height, and without space for large pieces of furniture; consequently, ill-proportioned and badly furnished. Windows in the roofs of dwelling-houses are also expressive of imperfect accommodation and ventilation, as are small windows in sunk stories. The windows of entresols (floors with low ceilings introduced between floors with high ceilings), which are common in France and Italy, are expressive of servants' apartments, and seldom fail to convey the idea of want of space, and of bad ventilation. When the base line of the windows on the principal floor of a house is horizontal, it is favourable to the expression of large rooms, and of rooms on the same level: on the other hand, when the windows are placed irregularly, and on no regular axis, either horizontal or vertical, they convey the idea of small rooms irregular in every respect, and altogether the opposite of being either comfortable or elegant. Turrets and projections of every kind, viewed with reference to use, convey the idea of commodiousness and convenience; it being supposed that their object, in modern houses, is to supply closets and cabinets, and other minor apartments. A square house may have all these conveniences included within its cubical form; and they may have cost less, in building, than if they had been contained in projections: but the cubical form will give no indication of their existence to the external spectator; and therefore, though it may be well adapted for economy, it cannot be considered as one expressive of ease and comfort. It will merely express, by its uniform-sized and regularly placed windows, apartments of equal dimensions and regular arrangement. Porticoes, colonnades, verandas, and balconies are all expressive, more or less, of comfort and elegant enjoyment on the part of the occupant. It is unnecessary, however, to pursue this subject farther; for every person of the slightest observation can refer all the different external parts of a house, in the country where he lives, to their internal uses: in other words, he recognises their expression.

2199. *The Expression of Use* in farm buildings, though it can only be perfectly recognised by an architectural farmer, can yet be so, to a certain extent, by every one accustomed to live in the country. The barn is known by its large roof, or by its greater height; or, in countries where threshing-machines are common, by the appearance of the mill-shed; the granary by its luffer-boarded windows, and its elevated floor; the feeding-house by its porthole windows, &c. The expression of the particular manufacture which is carried on in any large building can hardly be recognised by a stranger to that manufacture; nevertheless, the general appearance of the walls and windows; their great plainness, and even meagre effect; the number and regularity of the windows; and the comparative inattention shown to the beauty and clearness of the glass, enable almost any one to decide that the edifice is destined for manufacturing purposes. The expression of churches and chapels is recognised by all; because all are accustomed to enter them; so is the expression of schools, and of other buildings with which we are familiar, such as inns, corn mills, &c. That a building, when expressive of its use, affords more satisfaction than when it is either not expressive of that use, or expressive of some use to which it is not applied, every one must feel. A barn disguised as a church would afford satisfaction to none but those who considered it as a trick. The beauty of truth is so essential to every other kind of beauty, that it can neither be dispensed with in art nor in morals.

2200. *The Expression of adequate Construction* is, to a certain extent, recognised by every beholder. Every one knows walls of brick or stone to be more durable than those of earth, of wood, or of plaster; and no one considers a high and narrow building so strong as one which approaches nearer to the cubical form. Roofs which project considerably at the eaves, by exposing a part of their timbers to the eye, never convey the idea of the same degree of durability as when the walls are terminated by stone or brick cornices; and walls thus finished never give the same idea of a permanent roof, as when to the cornice is superadded a blocking course or parapet. The roof, in the latter case, is supposed to be flat, covered with lead, and calculated to resist the effects of time. The common precept, that openings ought in general to be made perpendicularly over other openings, rather than disposed indiscriminately, is founded on the principle of strength; for every one feels that the lighter members should be carried by the stronger. Without disputing this general rule, Mr. Wood observes, "perhaps two exceptions may fairly be made: the first in small buildings of no pretensions to magnificence, where the appearance of convenience may be allowed to overweigh the character of durability; and the second, where the general appearance is so solid, and the openings are so small, that it matters not where they are put. In this last case, the very want of correspondence announces an exuberance of power, which disdains attention to trifles; and, what is, in some degree, in ordinary cases, a source of absolute weakness, becomes a means of expressing strength." The indication of the thickness of wall produced in a wall seen

only on one side, by those ledges, or "settings back," which become necessary when it diminishes as it ascends, is expressive of strength; and the excess of the length and breadth of a building, relatively to its height, is indicative of stability. The value of these kinds of expression is found by contrasting them with whatever, in the elevation of a building, is indicative of weakness, temporary duration, or deformed construction. The reader will easily be able to supply, from his own observations or experience, innumerable instances of the same kind as those here given; the tendency of all which is to prove, that the expression of fitness of construction for the end in view, is a beauty in Architecture as positive, as that of the expression of fitness for the end in view itself.

Chap. III.

Of the Expression of Architectural Style.

2201. *The Expression of Architectural Style*, as may be inferred from the two preceding chapters, is not an essential beauty in a building. An edifice may be useful, strong, and durable, both in reality and in expression, without having any other beauties than those of use and truth; that is, of fitness for the end in view, and of expression of the end in view; or, in familiar language, of being suitable to the use for which it was designed, and of appearing to be what it is. The object of Architecture, as an art of taste, is to add to the beauties of use and truth other beauties, the creation of which is its peculiar province. The beauties of use and truth address themselves chiefly to the reason; those of Architecture, as an art of taste, address themselves jointly to the reason and to the imagination. All the arts of taste produce their effect upon the mind through the senses. Thus, music affects us by sounds, painting by colours, and poetry and oratory by words. Architecture and sculpture operate almost exclusively by forms; and they differ chiefly in this respect, that sculpture has for its object the production of the imitations of natural forms, while Architecture operates by combinations of forms entirely artificial.

2202. *The Beauty of Architectural Forms* arises from two causes: the expression of certain qualities which result from combinations of those forms, such as unity, variety, symmetry, &c.; and the expression of certain forms and details which have been consecrated to Architecture by long-continued use. The first may be called the universal and inherent beauties of all architectural styles; and the second, the historical or accidental beauties of particular styles. The first kind of beauty is altogether independent of any style of Architecture which has hitherto existed, or which may hereafter exist; its effect resulting entirely from organic impressions, and associations of a general nature: the second depends on the addition, to the first class of beauties, of the associations connected with the known forms and details of the different styles of Architecture hitherto in use, or which may hereafter come into use, in this and in other countries.

Sect. I. *Of the universal and inherent Beauties of Architectural Composition.*

2203. *The Production of a Whole* is the first object in every composition; because the mind can only comprehend with ease and satisfaction one object at a time. If two objects of different natures, in the same scene or view, present equal claims to attention, we can derive pleasure from neither, unless we have the power of abstracting the mind from one of them, and directing the attention wholly to the other.

2204. *Unity.* Hence it is that unity is the fundamental principle of all compositions whatever. If the reader will turn to the designs given in this work, and examine them one by one, without the slightest reference to their fitness for dwellings, or to their architectural style, he will find that a principal cause of the pleasure which he derives from observing them arises from their expression of unity. He will find that their general arrangement indicates a unity of mind and of system; that the prevailing forms, in any one design that strikes him as beautiful, are of the same kind; that the shapes and sizes of the openings are similar; and that the prevailing or most conspicuous lines are chiefly in one direction, and either perpendicular or horizontal. So much, indeed, is this the case, that we will venture to assert, if the reader finds the lines of some of the masses in any one design exceeding in a vertical direction, and those in other masses of the same design exceeding in a horizontal direction, that design will not give him much pleasure. Hence it is that a Grecian church with the long horizontal and depressed lines of its architraves and cornices, and a lofty spire at one end with its preponderance of perpendicular lines, never pleases so well as a Gothic church and spire, where the principal lines of the buttresses, and even those of the steep roof, all tend upwards, in unity with those of the spire. Hence, also, the reason why a portico to a circular building never forms such a

good whole with it as when it is placed against a right-angled building, or where the pediment over it forms the termination of a roof. For the same reason, a dome rising from a square base, or seeming so to do, is never so pleasing as one obviously forming the termination of cylindrical walls. The Architect, therefore, must have constantly in view the production, and the critic the discovery, of unity of system and principle, unity of conception and composition, unity of plan and elevation, unity of decoration, unity of style and taste, unity of the nature of the materials of which the building is composed, and unity even in the age, the colour, and the appearance of those materials. This fundamental principle of criticism the Architect ought to keep continually in view; not that the knowledge of this or of any other principle will insure his success in composition; but that, having a composition before him, or in progress, the principle of unity is one of the very best by which he can test what he has done, or proposes to do. To the critic this principle is also of more value than any other, from the great ease and certainty with which it may be applied.

2205. *Variety.* In order to keep alive in the human mind an interest in any subject, it is necessary that it should be operated upon by alternate excitement and repose. Now, as unity, when carried to its utmost limits, degenerates into monotony, the introduction of contrasts into every composition is necessary for the purpose of relieving it, and producing variety and harmony. Variety differs from harmony in having reference more to the details of the different component parts of a building, than to the effect of the building as a whole. Both variety and harmony are produced by contrast; but harmony, implying a greater combination of parts, admits of more numerous and powerful contrasts. (See *Harmony*, § 2217.) To produce variety in any composition, a certain degree of contrast becomes requisite in the lines, forms, colours, light and shade, and even, sometimes, in the nature of the materials. In introducing contrasts, the dangers to be avoided are, too great feebleness on the one hand, in which case they lose their effect, and produce insipidity; or, too great opposition on the other, when their effect is too powerful, and they produce discords. Discordance of form is one of the most conspicuous faults in Architecture: because, form being the principal attribute of matter with which the artist works, an error in this important feature of his composition is greater than one in lines, in light and shade, or in the nature of the materials. The introduction of contrasts, for the purpose of producing variety, is not only liable to end in discord, but it is also apt to degenerate into diversity. Diversity differs from variety, much in the same manner as complexity does from intricacy. Variety may be produced by a few kinds of lines and forms varied in their disposition, but always with a certain degree of connection; diversity is produced by many different kinds of lines and forms, also differently disposed, but having no leading principle of connection, and so little accordance among themselves as not to compose a whole. In attempting to produce variety, therefore, by the only manner in which it can be done, viz. the introduction of contrasts, the artist must be on his guard against creating discord, by having his contrasting forms of too large a size; or diversity, by having them too numerous, and of too many different sizes and shapes. For example, if to add some variety to the outline of a building, in which a square tower arose above the roof, a circular tower were added beside it, of the same height and general size, the effect would be discord; because the two objects, being of the same kind, of the same bulk, and at the same distance from the eye, would present equal claims to attention: while, from the total difference of their forms, that attention would be divided. Let, however, the circular tower either be of the same diameter as the square one, and raised only a few feet above the roof; or, let it be of the same height as the square one, and only a few feet in diameter, and the effect will be variety; because the attention will be then directed to the large tower, and the very low or very narrow one will not interfere with the claims of the large one. At the same time, the small tower, by being something different from the large one, will also excite a certain though less degree of attention, and thus occasion a varied exercise of that faculty. To show how diversity or complexity may be produced under similar circumstances, we have only to suppose that, instead of one tower, several were added, all of different forms, and all of the same size, and equidistant. They would, consequently, have all equal claims on the attention, which would thus be distracted; and the mind would be unable to trace any principle of order, by which so many different forms could be reduced to a whole.

2206. *Intricacy* is produced by number joined to variety, by which a certain degree of concealment is effected. It is a beauty chiefly sought for in the details of ornaments; but sometimes also in the composition of elaborate elevations, or in extensive interiors. The opposite of intricacy is confusion, into which this beauty is in continual danger of degenerating. To prevent this, a certain degree of unity of system, and unity of forms and lines, must pervade the whole composition; the same forms must frequently occur, and also the same manner of connecting them. "Nothing," says Alison, "is more delightful than, in any subject where we at first perceived only confusion to end

regularity gradually emerging, and to discover, among the apparent chaos, some uniform principle which reconciles the whole. To reduce a number of apparently dissimilar particulars under one general law of resemblance, as it is one of the strongest evidences of wisdom and design, so it is also productive of one of the strongest emotions of beauty which design can produce." (*Essays*, &c., vol. ii. p. 68.) Something of this kind of beauty may be felt on approaching an extensive villa in the Gothic style, with numerous towers and projections: seen in distant perspective, blended with trees, it appears a mass of parts which the mind cannot reduce into any order; in advancing towards it, some of these parts appear larger than others, and the smaller seem to be grouped around them; but, on arriving at the front of the building, the whole assumes a symmetrical disposition, and the mind and the eye become alike satisfied.

2207. *Symmetry, Uniformity, and Regularity* are terms which are considered by many as constituting the principal beauties of architectural productions. The reason is, that every one can recognise by these properties, in any object whatever, the evidence of design, and the idea of a whole. The rudest mind sees the evidence of design in a house with a door in the centre of the front, having a window on each side of it. This is symmetry; and it conveys the idea of unity, or a whole, because every thing that is to be found on one side of the door is to be found also on the other. The prevalence of one form for all the general masses, and of one form for all the doors and windows of a building, is what is called uniformity or similarity; and this gives pleasure for the same reason as symmetry; viz., that it gives evidence of design, and indicates the idea of a whole. The regular recurrence of any form at certain distances is also an evidence of design, and gives pleasure for the same reason; viz., that of assisting the mind in comprehending what is before it. These beauties are also more easily produced, and comprehended, than many others; and are, therefore, very properly, of universal application. The opposite extremes, into which they are apt to degenerate, are, dissimilarity in form and irregularity in disposition.

2208. *Irregularity*, when not carried so far as to produce confusion, is, however, desirable, as it joins to the beauty of uniformity the beauties of variety and of intricacy. "In general," observes Alison, "regular figures are more beautiful than irregular ones; and regular figures of a greater number of parts are more beautiful than the same figures of a smaller number of parts: they cease only to be beautiful when the number of their parts is so great as to produce confusion, and, consequently, to obscure the expression of design. It is the same principle which seems to produce the beauty of intricacy." (*Essays*, &c., vol. ii. p. 67.) See, on this subject, the remarks in § 119.

2209. *Simplicity* may be considered a negative quality in objects, since it does not imply any thing produced, but merely the absence of something else; that is, of complexity. The value of simplicity chiefly consists in its facilitating the comprehension of a whole; but, by contrast, it may become a positive beauty. In situations where all the buildings are of several stories, and elaborately finished, a shed or a cottage, with plain walls and a plain projecting roof, will be hailed as an object of simple beauty, from the repose which it affords to the eye, as contrasted with the excitement produced by the variety and intricacy of the more finished edifices by which it is surrounded. Simplicity, however, as Wood observes, "may be carried to an extreme, and persons of the best and purest taste will differ as to the precise degree of it required." Mr. Hosking, the author of the very excellent article on Architecture, in the seventh edition of the *Encyclopædia Britannica*, mentions simplicity as one of the fundamental elements of beauty in Architecture. Simplicity in form and outline he considers above all things essential, and he illustrates his opinion by reference to various existing examples. It appears to us, however, that he has, in some cases, made use of the word simplicity, where the term unity would have been more appropriate. For example, he says, "few can admire the external effect of the Pantheon in Rome, or of the Colosseum in London, though certain features in both may be indisputably good. To these may be added the church in Langham Place, London. The complication of straight and circular in the composition of these buildings, and their consequent irregular forms and discordant outlines, totally destroy both simplicity and harmony." We entirely agree with this criticism; but we think that the want of harmony is not produced by the absence of simplicity, but by the want of unity of form. At all events, this would be our mode of expressing what we consider wanting in such a case; and we have thought it necessary to state this here, to show that two critics may entirely agree in their opinion of a work, and yet differ in the use of terms for expressing that opinion. As a farther example of want of simplicity, Mr. Hosking refers to the more simple form of the Egyptian obelisk, as compared with the monumental column; and in this use of the term simplicity we wholly concur. Not so, however, in comparing the monument on Fish Street Hill with the shot tower at Waterloo Bridge. "They are both of cylindrical form," Mr. Hosking observes, "but the one is crowned by a square abacus, and the other by a bold cornice,

which follows its own outline. The greater simplicity, and consequent beauty, of the latter is such as to strike the most unobservant." To us it appears that the chief cause of this beauty is the unity of form in the two parts, and not the simplicity of the cornice because the square projection, when taken by itself, is equally simple with the round one. Langham Church is objectionable, not from its want of simplicity, because nothing can be more simple than the form of the main body of the building, which is that of a parallelogram, with a roof and sides as plain as those of a country barn; or than the spire, which is that of a cone; but from the want of accordance between the forms of a cone and a parallelogram; or, in other words, from the want of unity in the whole, which is thus attempted to be produced. Suppose the Architect had taken simplicity as a principle by which to test his design before it was executed; how far would that have enabled him to correct his work? Not far, we think; for both forms, as we have just shown, are simple enough. Suppose, on the other hand, that he had tested his work by the principle of unity; the want of unity of form between the body of the church and its spire must at once have taught him the risk which he incurred of producing that discordant result, which is now one of the most glaring deformities in the public buildings of the metropolis. It is singular that, among all the different criticisms which were made on this church at the time it was completed, not only in the newspapers, but in parliament, no one ventured to assign any cause for the dissatisfaction which every one felt. Had the principle of unity been familiar to its critics, the cause would have been assigned at once; and, indeed, in all probability, the bad effect of such a discordance of parts would have been foreseen before the building was erected, and an alteration would have been made in the Design.

2210. *Order and Propriety.* Order, in Architecture, implies the relation of one part to another, with reference to the production of a regular or symmetrical whole. The appearance of windows on one side of a building, if not followed up by windows on the next side, indicates a want of order; as it does, to find the windows of one side differ in size and disposition from those of the other. It is in the order of parts relatively to uses, that a porch, or portico, should protect a door; but, if, under such a projection, we find a window, instead of a door, while the door is perhaps seen in the same elevation without any protection at all, we feel the want both of order and propriety. The indication of a roof, where, according to the construction, a roof could not be placed, or would not be required, is, in like manner, a violation of both these principles. The opposite of order is disorder, which would be conspicuous in a building showing, on the same floor, windows of different sizes, and scattered irregularly over the surface of the elevation, without being grouped, or on a regular axis, vertical or horizontal.

2211. *Proportion* is one of the principal beauties of Architecture, as an art of design, though none appears to be more difficult to explain satisfactorily. Perhaps the principle on which proportion is founded may be defined to be, that relation between the dimensions of things of the same kind, which, in the given age and country, is generally considered the most pleasing. The origin of our received ideas on the subject of proportion must have been habit, perhaps founded on some reasons relative to fitness in the material employed. It is altogether unreasonable to suppose that the same proportions are in their nature equally beautiful, when applied to supports of timber, stone, and iron; but, from the habit of studying, with profound deference, the proportions of the columns used in Grecian Architecture, these proportions become familiar to the eye, and afford satisfaction, even when applied to different kinds of materials. The idea of certain proportions of columns, and of intercolumniations, possessing absolute beauty in themselves, without relation to the associations connected with them, appears to us a species of architectural bigotry altogether unworthy of an enlightened mind. "Our sense of proportion in every form," Alison observes, "keeps pace with our knowledge of the fitness of its construction: where we have no acquaintance with the fitness of any form, we have no sense of its peculiar proportions." (*Essays*, &c., vol. ii. p. 134.)

2212. *The Proportions of Rooms* are nearly agreed upon by British Architects. Sir William Chambers says "that these proportions depend, in a great measure, on the use and actual dimensions of the rooms; and that all figures, from a square to one in which the length is to the breadth as three to two, may be employed in the plan, and great licence taken with regard to elevation. Inigo Jones extended the plan to a double square; and galleries are frequently made four or five times as long as they are wide. When this is the case, however, they are better divided into moderate lengths, by piers projecting from the sides, as in the galleries of the Louvre in Paris, and that of Sans Souci, at Potsdam. "The heights of rooms," Sir William Chambers continues, "depend upon their figures: flat-ceiled ones may be lower than those that are coved. If the plan be a square, the height should not exceed five sixths of the side, nor be less than four fifths; and, when it is an oblong, the height may be equal to the width. In

coved rooms, if square, must be as high as broad, and, when oblong, their height may be equal to their width; increasing the height one fifth, one quarter, or even one third of the difference between the length and width, as may be thought desirable; and galleries should, at the very least, be in height one and one third of their width, and, at the most one and a half, or one and three fifths." (*Civil Architecture*, &c. Gwilt's edition, vol. ii. p. 390.) These precepts may be taken by the critic as those generally received by most European Architects and amateurs; and, though it is always a mark of a narrow mind to judge of any work solely by a reference to rules, instead of trusting to first impressions, and afterwards testing those impressions by general principles; yet it is well to know the limits within which an Architect supposes himself to be confined, in so important a matter as the proportions of rooms.

2213. *Magnitude.* "The Architect Vanvitelli," Forsyth observes, "sought, in his design of the palace of Caserta, grandeur from every dimension;" and it is certain that a building, like that palace, of great magnitude, regular in its general form, and enabling the spectator from one point of view to conceive an idea of its height, its length, and its breadth, produces an impression on the mind at once simple and grand. "There is always," says Wood, "something to admire in works of great magnitude and expense. One cannot walk along the covered way, about three miles long, from Bologna to the church of Madonna del Monte, without feeling impressed with admiration at the courage and public spirit which could undertake such a work, and the perseverance necessary to complete it." (*Letters*, &c., vol. i. p. 285.)

2214. *Magnificence* is an expression produced by the union of magnitude with general simplicity of form, and with great richness in the details. A large house, simple in its general forms, with large spaces between the external indications of the different floors, and between the windows of the same floor; but with the walls terminating in a highly enriched cornice, and with richly decorated architraves round the windows and doors, must be felt by every one to convey an idea of large and lofty apartments within, and of great wealth in the builder. "To produce the effect of magnificence in Architecture," Wood observes, "three things seem to be necessary; viz., greatness of dimensions, simplicity of design, and richness of decoration. To satisfy the mind after examination, three other things are requisite; viz., correctness of proportion in the parts; graceful drawing of the details; and delicate execution of the mouldings and ornaments. Great space left between the ranges of windows gives an air of solidity and magnificence to the front, and suggests the idea of lofty rooms within; and it is a great point gained, when, in addition to the magnificence which is seen, the artist can excite the idea of the magnificence which is not seen." (*Letters*, &c.) In general, magnitude, in connection with any circumstance which gives evidence of great wealth, is favourable to the idea of magnificence. The stables of the Prince of Condé, at Chantilly, are magnificent, from their magnitude, and their costly finishing; though, as the traveller Duppa observes, they are in the highest degree unfit for their purpose. They are without accommodation for a bushel of corn, or a single truss of hay; but they are upwards of forty feet high from the floor to the ceiling, and 600 feet long, with walls of polished freestone, and a magnificent dome in the centre. In the interior of towns and cities, it is an evidence of great wealth to find mansions situated in the midst of trees and gardens, surrounded by lofty walls, and entered by magnificent gates. Such mansions are more common in Moscow and Warsaw, and even in Paris, than in any other cities in Europe. In London, on the contrary, though there are numerous mansions, in all respects superior in accommodation, comfort, and luxury, to those of any other city in the world; yet, from their being in close contact with each other, and ranged in lines without any thing to distinguish them from common street buildings, but the absence of shops, and their having a somewhat more extensive frontage, they are totally without that expression of magnificence, to which they are amply entitled from the expense incurred, and the accommodation produced. In the last great square which has been, or perhaps, ever will be, erected in London, Belgrave Square, where the houses rent from 500*l.* to 1000*l.* a year each, there is not one of them that can have the slightest pretensions to magnificence. They have not even an element of this quality; and if a city tradesman, on his entering the square for the first time, were informed that houses, which are at present occupied by dukes, and other nobles of the first families in the land, were the residences of city merchants, or wealthy retired tradesmen, there is nothing in their appearance which could lead him to express the slightest degree of surprise. Let such a person go to Paris, and observe the hotels, which here and there occur, enclosed by walls, entered by magnificent gates, and surrounded by thickly-wooded gardens; and the evidence of great wealth, which these appearances afford, will prevent a doubt from arising in his mind of the grandeur and magnificence of their occupants. The impression will be still stronger if the traveller proceeds to Warsaw, to Moscow, or to Florence, Rome, and some of the other great cities of Italy. The truth is, that Englishmen excel in displaying magnificence only in the

interiors of their town houses; reserving all external magnificence for their palace-like villas in the country.

2215. *Elegance and Grace*, in objects of art, are terms generally understood to imply lightness of form, or delicacy of proportion, as contrasted with inelegance; that is, heaviness or clumsiness of form, and want of proportion. The terms lightness and heaviness are frequently applied to buildings by general observers; but they seldom convey any definite ideas to the mind. The term lightness seems to be commonly applied to elevations, in cases where the openings are more numerous, in proportion to the plain spaces of the wall, than usual; and, when the contrary is the case, the term heaviness is made use of. The same idea may be extended to the intercolumniations, and proportions of the columns of porticoes, and to various other parts of buildings.

2216. *Effect* is a painter's term, and in some cases it is synonymous with the word result; but in others it refers only to the light and shade of a picture or a building. Where there is a striking prominent part or principal light in a building, supported by a broad receding mass or a mass in shade, the effect is said to be good; but a building so plain in its principal front as to produce no striking lights and bold shadows is said to have no effect. The Italian manner of placing windows close together in series, and, alternating with these, large blank spaces without any openings (see § 1929.), produces a result which, in building, may, to a certain extent, be considered analogous to the effect of light and shade in painting.

2217. *Harmony* is a term transferred from music to Architecture, and implies such a composition of lines and forms as will produce a powerful, a varied, and an agreeable whole. Where great contrasts exist among the parts, and yet all of them are in accord, the effect is harmony; and this is the highest result, with reference to organic impressions, that can be produced in an edifice, short of, or next to, the beauties of decoration and character. Harmony, therefore, supposes unity, contrast, variety, order, proportion, and various other subordinate beauties. Notwithstanding this, however, harmony in Architecture, as in music, may exist independently of ornamament or of any distinctive character.

2218. *Ornament or Decoration*, in Architecture and furnishing, is the addition of something, not necessary to unity of expression, but added solely for the purpose of enrichment. Considered in an abstract point of view, the effect is produced by a certain degree of variety, and intricacy of outline; and, by blending, in a harmonious manner, lights, shades, and colours. The ornaments in exterior Architecture may be considered as exclusively sculpturesque; but those of the interior include colours, gilding, and mirrors, and may be called scenic. The too general distribution of ornament, or richness, on an elevation or a piece of furniture, is destructive of that simplicity and repose, which is necessary to the full enjoyment of any scene; but, on the other hand, when decoration is judiciously introduced, and correctly executed, it gives an air of high finishing and completeness, which leaves in the mind of the spectator nothing to be desired. Every thing in a building, or a piece of furniture, may be considered as ornament, which does not form a necessary part of the construction. In this point of view, the lines and mouldings of architraves and cornices, the facings of windows and doors, and the projecting mouldings of chimney-tops and other parts of dwelling-houses, may all be considered as ornaments; and, as they necessarily arise out of the construction, they may be termed ornaments of the simplest, but, at the same time, of the most appropriate kind. A step higher in the progress of ornament or decoration, consists in the introduction of carving or sculpture, such as foliage and flowers, on the members of architraves and cornices, or other appropriate ornaments. The introduction of sculptures in high or low relief, in sunk or raised panels, or other compartments prepared on purpose to receive them, constitutes a third step. The last step is that of introducing vases and detached figures, in suitable situations, such as on the summits of pediments, or as terminations for piers, pilasters, columns, &c.; and these may be considered the noblest ornaments of all, since they are without any other use than as such. This scale of ornament will enable any one clearly to understand in what ornament consists; and it will also show the propriety of consistency, in the degree of ornament to be applied. For example, in a very plain elevation of a house, without facings to the windows, or a porch to the door, or a terminating cornice to the wall, it would be an improper style of decoration to add vases or statues. The first step in ornamenting such an elevation would be, to add facings or architraves to the doors and windows; next a porch, and a cornice under the roof, or near the top of the walls. After this was done, if a degree higher in the scale of ornament should be considered desirable, perhaps vases might form terminations to the supporting pillars of the porch, or projecting balconies might be added to some of the windows. Instead of proceeding in this manner, we frequently find Architects, when they are called upon to decorate a naked elevation, introduce ornaments of the highest class, such as sculptures or vases; while all appropriate ornaments, such as finishings to windows

and doors, are omitted. It must be clear to our readers that this is in the very worst taste: as bad as it would be in a lady to wear a pearl necklace and diamond tiara with the costume of a kitchen-maid. A number of the Designs in this volume, when tested by this principle, will be found sadly deficient. Let the reader turn to them, and exercise his critical skill; he will gain far more in doing so, than if we had presented him with a series of faultless objects; for we are convinced, with Wood, that the young Architect will learn much more by the discovery of faults, and their causes, than by the mere admiration of beauties. As affording much valuable instruction on this subject, we would strongly recommend the young Architect to consult Quatremère de Quincy's *Essai sur l'Imitation*, and the Preface to Percier and Fontaine's *Décorations Intérieures*.

2219. *Character*, in Architecture, as in physiognomy, is produced by the prevalence of certain distinctive features, by which a countenance, or a building, is at once distinguished from every other of the same kind. Hence, numbers of buildings, like numbers of human beings, may exist without exhibiting any marked character. On the other hand, there may be edifices, which, from their general proportions being exalted, and from all their parts being justly distributed, exhibit what is analogous to nobleness of character: edifices having, as a conspicuous feature, a form not common in Architecture, will assume a character of singularity; others, having a common form placed in an uncommon position (such as a large window in a spire, or, as is the case in some of Sir John Vanbrugh's buildings, and in the offices of one of the houses at the north-west corner of Belgrave Square, a doorway introduced in the parapet to a roof), will appear to possess a character of extravagance or caprice. In general, whatever is productive of character in a building must be conspicuous and distinctive; and it should rather consist of one than of many features.

2220. *Novelty.* In all arts, novelty is a source of pleasure; because every new object that is presented to the mind excites it to action; and the mind of man, to be kept in a healthy state, requires exercise as well as his body. The effect of novelty can be felt by the most ignorant and also by the most learned observer; and, though it has been customary for critics to rail at it under the denominations of fashion and innovation, yet nothing can be more certain than that this quality is what all artists are in pursuit of, in connection with other kinds of excellence. It is equally certain that this incessant desire for novelty has been the cause of great departures from propriety of design in all the arts; and, therefore, though the artist ought to be unceasing in his endeavours to attain it, he ought never to indulge in novelties which are in opposition to what are considered established principles. Precepts and rules, however, are subordinate to principles; and a precept or a custom may be departed from for the sake of novelty, provided that in so doing no infringement be made on such principles as those of fitness, utility, or propriety. For example, it would be a novelty, in the elevation of a house, to have the windows broader at bottom than at top, or circular at bottom as well as at top; but, the unfitness of these forms for the application of window-shutters, and other ordinary purposes, would occasion the innovation to be instantly condemned, when examined by the principle of fitness. It would be a novelty, in this country, to connect the different apartments of a house by means of outside stairs and balconies, as in Switzerland; or to have the kitchen in the attics, as in Italy; but these innovations would be objected to in Britain, on the principle of unsuitableness for use. A window used as a door, and a door used as a window, are also objectionable, from the obvious want of propriety in their application. The attempts at novelty, which have ended in absurdities, have been much more numerous in the interior and furnishing of houses, than those which have been made in exterior elevations: the chief reason is, that the interior finishing and furniture of a house are much more frequently changed and remodelled than the house itself; less care and skill are bestowed upon them, and less exertions are made to procure the opinion of Architects of taste (as we have before recommended), on every change, however small. As examples of bad taste, resulting from a desire of novelty without regard to consistency, we may mention, that of graining wood with blue veins, blue being a colour never found in nature in the interior of timber; and that of reversing the positions of the vase and the sarcophagus when placed under sideboards as wine-coolers, thus converting some of the most beautiful forms of antiquity into the clumsiest and most inexpressive shapes. Yet, we have seen both these examples of bad taste perpetrated in the houses of wealthy Londoners. The great aim of the artist ought to be to create, and that of the critic to search for, the union of novelty with other beauties, without any greater innovation of established rules than is consistent with fundamental principles. For example, let the artist introduce a new style of Architecture and furniture, if he can; but, in doing so, let him never violate the principles of unity and harmony. Let him introduce a new description of porch or chimney top; but let the one always be a protection to a door, and the other afford a favourable outlet to smoke. One of the

safest manners of introducing novelty, without any violation of established precepts, is by the revival of ancient styles of art; by which is produced what is at once new and yet familiar, instead of what is new and at the same time strange. Hence, the satisfaction that has, for some time past, been produced, in this country, by the revival of the Gothic style, in external elevations, and by its application to modern uses in internal finishing and furniture. More recent examples of the same kind will be found in the present taste for the Elizabethan style, and for that of Louis XIV. in furnishing. To imitate freshness in an old building by renovation, or the appearance of age in a new building by weather stains, are both sources of novelty, of no great value certainly, but still suitable for occasional use. For example, the general effect of an old ruin may be increased by renovating, and producing an appearance of freshness in a small part of, or in some appendage to, it. In a line of detached villas newly built, all exactly of the same form, material, and style of finishing, one may be rendered strikingly different from all the rest, solely by weather stains.

2221. *Other Terms of Art* might here be introduced, and their application to Architecture explained; but to do justice to the subject would require much greater space than would be admissible in this volume: it would, indeed, require a volume itself. The truth is, that all the works of man are only manifestations of himself, representing the qualities of his own mind, moral and intellectual, good or bad, ignorant or refined. Hence, most of the terms that are applicable to manners and to mind are applicable also to art; and a building or a picture may exhibit beauty, deformity, boldness, timidity, strength, weakness, nobleness, meanness, grandeur, littleness, wisdom, folly, reason, caprice, and many other qualities. For example, the projections of the cornice of a building carried rather farther than usual would be considered bold, and give that character to an elevation; carried too far, they would be considered rash; and not far enough, timid. Walls thick in proportion to their height indicate strength; and the contrary, weakness. Dimensions and proportions of all the parts, and especially those which regard height, larger than what are usual, produce an impression on the mind analogous to nobleness; and smaller than usual, and especially as regards height, meanness: to be mean, a building must be low. The expression of grandeur is easily understood; that of littleness is produced by comparative smallness of dimension applied to objects generally seen large. The want of wisdom will be conspicuous in any building, the expression of which does not satisfy the mind as well as the eye; for example, if the artist appears to have bestowed too much strength or skill on one part, and too little on another. The folly of an Architect would be conspicuous, were he to sacrifice the main body of a building to any inferior part, as for instance to the portico; or to attempt to build and ornament a cottage in imitation of a palace. Nothing is more common in the works of Architects even of genius, such as Vanbrugh and Borromeo, than caprice. It is the business of a critic, after he has allowed the full effect to be produced on him by the first impressions of an object, to search for its deformities as well as its beauties; and to point out the one to public attention, as well as the other.

2222. *Relation.* After the critic has applied all the preceding principles to any edifice, and various others of the same nature, which will readily occur to a thinking mind, it remains for him to examine it in its several relations. If it is seen in the same view with other buildings, it must be considered not merely as a whole by itself, but also as forming a whole in connection with the other buildings which are near it. In this point of view, an edifice may be so plain in itself, as to exhibit little or no variety or intricacy; and yet, when viewed along with the other buildings, it may produce one general combination of harmonious forms. For example: suppose a line of five or six detached but nearly adjoining houses, already existing, each house broken into several parts, and that an Architect were required to add an additional house at one end of, or any where near, the line; it might reasonably become a question with that Architect, whether it would not be advisable for him to render the additional house one simple and grand mass, so as to form with the whole line, when taken together, a predominating and principal part. In like manner, in judging of a building of any particular age or country, the circumstances of that age or country at the time, require to be taken into consideration. In judging of the modern buildings of Italy, for instance, it must not be forgotten that almost all the modern Italian Architects were painters as well as Architects; and that almost the whole of their public buildings are addressed more to the eye than to the reason. In judging of the buildings of the reign of Louis XIV., it must be considered that the great object of the Architects was to follow the taste of the court, which was that of extravagant decoration. In judging of the taste of churches, and of sumptuous public buildings in all countries, it must not be forgotten that the great object was to excite the admiration and the astonishment of the spectator. In judging of those public buildings in Britain, in the Grecian style, which were erected previously to the publication of Stuart's *Athens* or Wilkins's *Magna Græcia*, it

would be altogether unreasonable to compare them with the designs constructed since that period. The Gothic Architecture of Batty Langley (a name sneered at by modern critics), or even that of Inigo Jones, it would not be just to compare with the Gothic of the present day; a knowledge of which has been matured by the excellent publications of Carter, Murphy, Britton, Pugin, Cottingham, Lamb, and a number of other authors. Thus, a critic must always have two standards of comparison to judge by: the one, that (as well as he can conceive it) of the time when the building was erected; and the other the *beau idéal* of perfection in his own mind. There is another point that must not be lost sight of, in judging either of ancient or of modern productions in Architecture; and that is, the means which the Architect had at his command, and the control which he was under from his employers, at the time of erecting the building. There is not, perhaps, one edifice in a hundred, either public or private, where free scope is left to the Architect, even where he is previously informed of the amount which will be allowed to be expended for the work, and keeps within that amount. Numerous local circumstances, which could not be foreseen, or over which he has little or no control, continually interfere to prevent him from completing his designs agreeably to his own taste and judgment. Since, then, few persons have ever an opportunity of doing their best, charity should, in all cases, be exercised by the critic. To those who wish to pursue the subject of this section farther, it is satisfactory to be able to recommend three works which are within the reach of every one; viz., Alison's *Essays on Taste*, Wood's *Letters of an Architect*, and the *Dictionnaire Historique d'Architecture* of Quatremère de Quincy. The works of Durand, Repton and Papworth, Aberdeen's *Inquiry*, and Carlisle's *Hints* (or rather scraps), may also be read with advantage, by those who wish to unite the study of Landscape Gardening with that of Architecture.

Sect. II. *Of the different Styles of Architecture.*

2223. *The different Styles of Architecture* have grown up with mankind, and are easily recognised by every one as beauties of art, originally composed to be admired, and subsequently sanctioned by the admiration of ages. Hence it is that the Architect who endeavours to effect his object through the medium of any known architectural style will be much more likely to attain it, than he who depends for success on the organic impressions and general associations which form the subject of the preceding section; or on what an Architect might call the abstract composition of lines and forms. In that section, we have chiefly endeavoured to show that every thing in Architecture connected with use, the expression of use, and the expression of those qualities which are common to all the fine arts, can be effected without the introduction of a single form or line which is considered characteristic of any known architectural style. It must be obvious to the reader who has understood our preceding observations, that, in the employment of any of the architectural styles which form the subject of the present section, the Architect, to produce a satisfactory whole, must be governed by the abstract principles of composition already laid down, as much as if no style were resorted to. The principle of unity must govern a composition, whether it consist of mere walls with openings; or, as a painter would say, of mere light and shade; or of Grecian columns and entablatures, or Gothic gables and buttresses. Variety is required for a Grecian or a Gothic composition, as well as for one of mere lines and forms; and simplicity is as necessary for the general form of a Gothic cathedral as it is for that of a Grecian temple. There are, however, great advantages in the employment of style in Architecture.

2224. *By the Employment of Style in an Edifice*, the Architect takes immediate possession of the prejudices of mankind. He gains a positive beauty at once by the mere exhibition of style; because thousands of spectators in Europe and America, for example, have some crude ideas of what is Grecian and what is Gothic, while comparatively few understand what constitutes a whole in mere combinations of form. Style, therefore, ought never to be neglected by Architects who wish to gain general applause.

2225. *The different Styles of Architecture* are so well known by Architects, and this knowledge is so readily accessible to the general reader, that very little need be said respecting them in a work like the present. All the styles which have ever existed, or which now prevail in the world, may be reduced to two, the Gothic, or perpendicular, and the Grecian, or horizontal; or that in which perpendicular lines, and that in which horizontal lines, predominate. As it is essential that all walls be built erect, it is not probable that, in any style whatever, curved lines should prevail over straight lines; unless, indeed, fitness and reason should be entirely laid aside.

2226. *The Grecian Style* may be considered as characterised by porticoes of columns, with pediments joined to parallelograms, in regard to general forms; and by a particularly beautiful description of mouldings and ornaments in the details. The porticoes and pediments are altogether unfit for private dwellings, and there is no evidence that they were ever so applied by the Greeks. At all events, that there is "great difficulty," as

Mr. Hosking observes, "in applying pure Grecian Architecture to modern practice," is evident from the buildings of the Romans, and from the want of success which has attended the attempts which have hitherto been made in Britain to introduce the pure Grecian style into villas and private dwellings in the country. We may pass over this style, therefore, for that modification of it known as the Roman or Vitruvian, which, till the publication of Stuart's *Athens*, and similar works, was considered by Architects as Grecian. Before proceeding to Roman Architecture, we may briefly notice the alleged prototype of the pure Grecian style; viz., a wooden hut; the roof supported by trunks of trees, and these trunks joined by horizontal beams. That there is a semblance of truth in this is evident: a hut may have given rise to the Grecian style; but if it did, still its construction appears to us to afford little or no information as to the management of Domestic Architecture in that style. All arts have had their origin in some very rude beginning; and the first artificial human shelters must, no doubt, have been either huts formed by the trunks or branches of trees, or caves dug in the sides of hills or banks. The hypothesis before noticed, of Laugier and others, that Architecture on this account is an imitative art, we consider to be altogether fanciful; and, if we were asked to refer to any work where this hypothesis was disproved, we should point to the Dictionary of Quatremère de Quincy, and to the articles in that work attempting to prove it.

2227. *The Grecian Architecture of the Romans* is characterised by the introduction of arches; by the placing of several stories one over another; and by great licence in every thing relating to proportion. It may be described as having little or none of that simplicity which is one of the greatest beauties of the Grecian temples; but, on the other hand, it admits of all that variety of form, disposition, and details which is suitable for the construction of private houses. It is, in fact, the prevailing Architecture of Europe, and of the civilised world; simply because it is the easiest, and, when without columns and decoration, the most economical, style of building.

2228. *The Modern Roman, or Italian, Style of Architecture* differs from the ancient Roman partly in the introduction of still greater licence in regard to columns and their disposition, but chiefly in its aim to produce painter-like effects. There are several varieties of the Italian style, distinguished by the names of the centuries in which they prevailed; and some of these varieties contain a mixture of Gothic forms and mouldings. The great object of the modern Roman Architect seems to be, to produce harmony by means of various contrasts of form, and of light and shade. Enough of Roman details are exhibited by this manner, in even the plainest buildings used as country residences, to keep up the idea of style, and to create allusions to Roman Architecture; but, when this is done, the next grand object appears to be, to please the eye of a judge of general composition, rather than that of a servile follower of the five orders. We have already expressed (§ 1933) how highly we approve of this style, as being economical, and suitable for dwellings for the general mass of society.

2229. *The Gothic Style*, characterised, as we have already observed, by vertical lines, or lines pointing upwards, consists of many varieties: some of them so delicate and peculiar, that they are difficult to describe. In almost all of them, Hosking observes, "the arch is considered the index to the variety, as the column is to the different orders in columnar Architecture." After the very excellent essay by Mr. Trotman on this style (§ 1872), it is unnecessary here to enter into details; but we must observe, that all the different varieties of Gothic Architecture are, in an especial manner, adapted for domestic use. In no style is unity of form and system more easily given and maintained; and, in Britain more especially, none is better calculated for producing emotion, for the reason before stated; viz., that almost every one who has been in the habit of frequenting a country church is familiar with its details. The superiority of this style to the Grecian, Roman, or Italian, in a scientific point of view, is well known to every one at all acquainted with the principles of construction. This superiority was for the first time pointed out in detail to the English reader by Dr. Anderson, in a series of essays, published in his *Recreations in Arts and Natural History*. Before the appearance of these essays, the merits of the Gothic style were not at all understood. It is now acknowledged by the first Architects, that the ancients knew very little of the science of construction; and the precepts of Vitruvius and Pliny on that subject are considered as imperfect or erroneous. It is also allowed that "the strength and duration of the Egyptian, Greek, and Roman structures are more owing to the quantity and goodness of their materials, than to any great art in putting them together." (*Chambers.*) There is more constructive skill shown in Salisbury and others of our cathedrals," Mr. Gwilt observes, "than in all the works of the ancients put together." An ingenious hypothesis on the origin of Gothic Architecture, by Sir James Hall, who considered wicker-work and the interlacing of young trees as its original type, is about as plausible as the hypothesis of the hut as the type of Grecian Architecture. In the admirable work of Seroux d'Agincourt, it is proved that the first Gothic building in Italy was an excavation

in a soft rock; the coved ceilings and the arches to the doors and other openings being finished in imitation of the Grecian ogee moulding. It is clear also from Mr. Trotman's essay, and the work of Mr. Rickman, that the Gothic style originated in an imitation of the Roman. The reader who wishes to study the different varieties of Gothic, or Pointed, Architecture may turn back to Mr. Trotman's essay, or have recourse to Mr. Rickman's succinct, and, at the same time, comprehensive, work on that subject.

2230. *The Elizabethan, or Old English, Style*, or rather manner, of building, is to the Gothic, what the Modern Italian is to the Roman: it is a mongrel style (more so, indeed, than the Italian), composed of Roman and Gothic details. From its extensive use in the mansions of this country, at a time when some of the largest were built, it has come to be considered as peculiarly appropriate to country residences. Perhaps, as a British domestic style, it has more interesting associations connected with it than any other; and there is nothing in its forms and details but what may readily be adapted to every modern convenience and luxury.

2231. *There are various other subordinate Styles or Manners of building*, to which the student may have recourse, in order to store his mind with ideas, and enable him to produce novelty in connection with excellence. There is the Egyptian style, characterised by its colossal forms and massive grandeur; from which, however, but few ideas can be derived applicable to domestic purposes; and the Chinese style, the type of which is a tent, but which, as far as it is known in this country, seems by no means a complete system in itself. There appear to be two styles or manners in India; one, the Hindoo Architecture, analogous to the Egyptian, the type of both being an excavation in the front of a rock, or on the side of a hill; and the other, bearing some resemblance to the European pointed style, and which has been called the Indian Gothic. This style is also sometimes called Arabian, Saracenic, or Moorish Architecture; and is an interesting and fanciful style, which owes its birth to the Mahometan religion. All these styles and varieties of styles will be found described in *Letters on the Principles of Design in Architecture*, and in the *History and Analysis of all the Principal Styles of Architecture*; both small and cheap books, easily to be procured. See also the very excellent *Treatise on Architecture and Building*, by William Hosking, Esq.

2232. *On the Subject of Style in Architecture* much more might here be said; but we conceive it of far greater importance that the reader should understand the general principles of composition, than that he should become learned in the details of any particular style. Hitherto Architecture has been too generally considered as consisting of an accurate display of the features and details of the best precedents of some particular style, without reference to abstract principles of composition; but we think that the student who would excel in this art should, in the first instance, have recourse to the study of general composition; and should consider the study of the Grecian and Roman orders, and of their various proportions and mouldings, as altogether subordinate. We are persuaded that the leading causes why Architecture has made such little progress in this country are, the general neglect by Architects of universal principles, and the almost exclusive attention paid by them to precedents and to established rules. Were we to direct the studies of a youth intended for the profession of an Architect, the very last part of the course of instruction which we should prescribe to him would be the study of the five orders. We consider them about as necessary to good sense, and good taste, in Domestic Architecture, as the study of the Greek and Latin languages is to the knowledge of what is good sense and good taste in the general conduct of life. Before, however, we recommended any youth to study Architecture as a profession, we would endeavour to ascertain, upon phrenological principles, or from general observation, whether his organisation was favourable for that pursuit. One of the grand causes of the slow advancement of all the arts of taste, and of the great prevalence of mediocrity among artists, is, the utter neglect of this preliminary measure on the part of their parents or advisers. Young men are articled to Architects, or sent to study painting or sculpture in academies, on the same principle as they are brought up to the common trades of life; and the result is, that, instead of men of native genius being, by cultivation, rendered skilful artists, the same degree of instruction, bestowed on men not possessing any natural talent, only produces mechanical artisans, or servile imitators of what has been done by their predecessors.

SUPPLEMENT.

INTRODUCTION.

Since the publication of this Encyclopædia, in 1833, we have carefully watched the progress made in the knowledge and practice of the subjects of which it treats, in order to add to our stock of ideas with a view to a new edition, or a Supplement. For this purpose we commenced the *Architectural Magazine* in 1834, and continued it for five years, recording in it a variety of information, not only on the subjects embraced by this Encyclopædia, but on every other department of architecture, public as well as private, with the view of rendering architecture a popular study. Though we gave up the *Architectural Magazine* in 1839, yet we have been ever since not less eager in collecting materials for this Supplement. We have examined all the recent publications which bear on the subject, including the *Sanitary Report of the Poor Law Commissioners* just published; and we have inspected a great many cottages, villas, farmeries, and schools, in different parts of England and Scotland. We have had designs of cottages and villas submitted to us for criticism and amendment from all parts of the country, and even from North America and Australia; and we have been in the constant habit of receiving architectural communications from professional friends and correspondents, more especially since we announced, above a year ago, our intention of bringing out this *Supplement*. From the great abundance of materials thus brought before us, we have made a careful selection, which we have arranged under the heads of— 1. Cottages for Labourers and Mechanics; 2. Cottage Villas and Villas; 3. Farmeries; and 4. Schools, Public-houses, Union Work-houses, and Alms-houses. We have added, 5. a chapter on Construction and Materials; 6. one on Fittings-up, Finishing, and Furniture, generally applicable; and 7. one containing Hints to Proprietors desirous of improving the Labourers' Cottages on their Estate; and we have given a new General Index, including in it the body of the work as well as the Supplement.

We have numbered the paragraphs in continuation from the last paragraph in the Encyclopædia, for the sake of uniformity both in the text and the Index; and we have frequently referred to paragraphs and pages in the body of the work, in which the same subjects are treated of, for details which it would have been superfluous to repeat.

Chap. I.

Cottages for Country Labourers and Mechanics, and for Gardeners, Foresters, Bailiffs, and other upper out-of-door Servants in the Country; including Gate-Lodges and Gates. (Encyc. of Cott. Arch., p. 8.)

2233. (1336. to 1341.) *Present State of Labourers' Cottages.* Instead of adding any remarks of our own to those already given in the Encyclopædia, on the present state of labourers' cottages, or the benefits to labourers and to the country generally from improving them, we give the following extracts from a recent pamphlet, entitled *The Peasantry of the Border*, &c., by the Rev. Dr. Gilly, Vicar of Norham, in Northumber-

land (1841), from the *Sanitary Report of the Poor Law Commissioners* (1842), and from a recent work on *Manures and Farming* by Mr. Donaldson. We give these extracts to prove to the reader the great necessity of improvement in the cottage of the labourer, and more especially of the agricultural labourer.

"The general character of the best of the old-fashioned hinds' cottages in this neighbourhood [Norham, on the banks of the Tweed, not far from Berwick] is bad at the best. They have to bring every thing with them; partitions, window-frames, fixtures of all kinds, grates, and a substitute for ceiling; for they are, as I have already called them, mere sheds. They have no byre for their cows, no stie for their pigs, no pumps or wells, nothing to promote cleanliness or comfort. The average size of these sheds is about twenty-four feet by sixteen feet. They are dark and unwholesome. The windows do not open, and many of them are not larger than twenty inches by sixteen inches. And into this space are crowded eight, ten, and even twelve persons. How they lie down to rest, how they sleep, how they can preserve common decency, how unutterable horrors are avoided, is beyond all conception. The case is aggravated when there is a young woman to be lodged in this confined space, who is not a member of the family, but is hired to do the field-work, for which every hind is bound to provide a female. It shocks every feeling of propriety to think that in a room, and within such a space as I have been describing, civilised beings should be herding together without a decent separation of age and sex. So long as the agricultural system, in this district, requires the hind to find room for a fellow-servant of the other sex in his cabin, the least that morality and decency can demand is, that he should have a second apartment, where the unmarried female and those of a tender age should sleep apart from him and his wife." (*The Peasantry*, &c., p. 20.)

The agricultural labourers' cottages in Bedfordshire, according to the *Sanitary Report*, are not much better. "If we follow the agricultural labourer into his miserable dwelling, we shall find it consisting of two rooms only. The day-room, in addition to the family, contains the cooking utensils, the washing apparatus, agricultural implements, and dirty clothes, the windows broken and stuffed full of rags. In the sleeping-apartment the parents and their children, boys and girls, are indiscriminately mixed, and frequently a lodger sleeping in the same and only room; generally no window, the openings in the half-thatched roof admit light, and expose the family to every vicissitude of the weather: the liability of the children so situated to contagious maladies frequently plunges the family into the greatest misery. The husband, enjoying but little comfort under his own roof, resorts to the beer-shop, neglects the cultivation of his garden, and impoverishes his family. The children are brought up without any regard to decency of behaviour, to habits of foresight or self-restraint; they make indifferent servants. The girls become the mothers of bastards, and return home a burden to their parents or to the parish, and fill the workhouse. The boys spend the Christmas week's holiday and their year's wages in the beer-shops, and enter upon their new situation in rags. Soon tired of the restraint imposed upon them under the roof of their master, they leave his service before the termination of the year's engagement, seek employment as day-labourers, not with a view of improving their condition, but with a desire to receive and spend their earnings weekly in the beer-shop; associating with the worst of characters, they become the worst of labourers, resort to poaching, commit petty thefts, and add to the county rates by commitments and prosecutions." (p. 178.)

The same writer gives the following picture of an improved cottage:—

"On entering an improved cottage, consisting, on the ground floor, of a room for the family, a wash-house, and a pantry, and three sleeping-rooms over, with a neat and well cultivated garden, in which the leisure hours of the husband being both pleasantly and profitably employed, he has no desire to frequent the beer-shop, or spend his evenings from home; the children are trained to labour, to habits and feelings of independence, and taught to connect happiness with industry, and to shrink from idleness and immorality: the girls make good servants, obtain the confidence of their employers, and get promoted to the best situations." In short, as another Bedfordshire writer observes, in the same *Report*, the cottager feels that he is somewhat raised in the scale of society. He sees his wife and family more comfortable than formerly; he rises in respectability of station, and becomes aware that he has a character to lose. Having acquired these important advantages, he is anxious to retain and improve them. (p. 177.) On the other hand, "a man who comes home to a poor comfortless hovel, after his day's labour, and sees all miserable around him, has his spirits more often depressed than excited by it. He feels that, do his best, he shall be miserable still, and is too apt to fly for a temporary refuge to the ale-house or beer-shop. But give him the means of making himself comfortable by his own industry, and I am convinced, by experience, that, in many cases, he will avail himself of it." (p. 178.)

Speaking of the cottages in the improved districts of Scotland and the North of England, Mr. Donaldson, in his excellent work on *Manures and Farming* (London, 8vo, 1842), expresses a hope that improvement, now so general in every department of rural economy, will soon be extended to them. "The square space," he says, "forming one apartment, huddling together a numerous family as in a penfold, constitutes a blot of no small magnitude in the social economy of those northern counties where the genius of agriculture has been truly said to have fixed its chosen residence. The accommodations provided for the farmer and the farm stock have formed a most marked, and it may be added, a very discreditable contrast with the habitations provided for the labourers, without whom the former could not exist. The arrangement of the dining and the drawingroom has engaged the attention of the farmer; the skill of the architect has been employed in erecting convenient accommodations for the poultry and the pigs, the gig and the saddle horse, while any hovel is reckoned sufficient for the labourer; the moving power, the sinew and strength of every active employment. Any improvements in cottage accommodations have mainly arisen from the manufacturing class; and wherever the number of that class is greater, there the country is richer, and the social condition improved in every respect; for a purely agricultural district is ever a poor one for the labourers. Payment of wages partly in produce is preferable for resident country labourers; and a garden, and accommodation for cow and pig, will add much to their comfort." (*Treatise on Manures, &c.*, p. 384.)

Though we are convinced that the only permanent security for the amelioration of the lowest classes is to be found in enlightening and elevating their minds by education, yet, as this can only apply to the rising generation, or rather perhaps, in this country at least, to a generation yet unborn, the existing race can only be benefited by the humanity and kindness of those of their employers who are men of wealth. The unhappy unsettled habits of common British labourers, whether in agriculture or in manufactures, which, we believe, far exceeds anything of the kind which exists in any other country, can only be changed by something which will induce them to forego a present enjoyment for a future good; and, in the present state of things in this country, we know no way in which this can be so easily done, as by arranging so as that every married country labourer may occupy a comfortable cottage and garden.

We shall arrange this chapter under the heads of—1. Designs for Model Cottages. 2. Select Cottages erected. 3. Miscellaneous Designs partly erected. 4. Details of Construction. 5. Cottage Fittings-up and Furniture; and 6. Villages.

Sect. I. *Designs for Model Cottages.* (Encyc. of Cott. Arch., p. 8.)

2234. (13.) The model cottages given in the body of the work are to be regarded as exhibiting the beau-ideal of the accommodation and comfort which a building of the humblest class may be made to supply: those which we are now about to submit are progressive in accommodation; and in the lowest of them there is absolutely nothing that can be omitted without destroying the comfort of the occupant, and, in short, reducing the accommodation to that afforded by those wretched Northumbrian hovels, so feelingly described by the Rev. Dr. Gilly. We have given two fundamental models: one calculated for agricultural labourers, and especially ploughmen, who, in many parts of the country, keep a cow and pig, and have a garden of from one eighth to one sixth of an acre; the other calculated for working mechanics, living in outskirts of towns or in villages, who are supposed seldom to keep a cow, though sometimes a pig, but who, generally, in addition to a cottage, occupy a piece of garden ground of from an eighth to a sixth of an acre, or more.

2235. *The Cow-house and Pigsty.* Many persons object to having these appendages near a dwelling, as tending to render it unhealthy, from damp, smells, &c.; but practically, where the construction and management, and especially the drainage, are good, we consider the objections as unimportant. On the Continent, where the summers are much warmer than in England, the smell of a stable or a pigsty, when under the same roof as the cottager's dwelling, is often a nuisance: but this is chiefly when they are entered by the same door as the living-rooms; for, when they are entered at different doors at some distance apart, the case is totally different, more especially in our comparatively cool climate. As a proof of this, we may refer to those agricultural districts where the cottages, cow-houses, pigsties, &c., are properly constructed, and placed; as, for example, the Earl of Leicester's estates in Norfolk. The agricultural labourers, in many parts of Scotland and the North of England, are allowed the keep of a cow as a part of their wages. In the summer season the cow is generally grazed in the fields along with those of the master, and sometimes (and this we consider the best mode) the winter keep is given along with that of the master's cows. In this last case no cow-house is required as an appendage to the agriculturist's cottage. There are, however, many cases in which the master allows

the ploughman so much food for the winter's keep of his cow; and there are, besides, a numerous class in agricultural districts who look upon a cow as essential to the comfort of their families. Under these various circumstances, therefore, we have considered it advisable to provide a cow-house to this class of our model cottages.

2236. *Pigs, Rabbits, and Poultry.* Wherever there is a garden there is always a quantity of refuse, and though this, with the waste of the family, will not fatten a pig, yet it will keep it in a growing state; and, when full-grown, corn, beans, or meal, may be purchased for fattening it. At all events, if it will not keep a pig it will keep rabbits. (§ 769. and 1394.) Poultry may almost always be kept by the cottager; and, to derive the greatest advantage from it by having eggs in the winter season, the poultry-house should always be in a warm situation. (See § 1329.)

2237. *General Arrangement.* In the models we have supposed the cottages to be placed on platforms, raised eighteen inches above the natural surface, to insure dryness; and the floors of the yards behind we have supposed to be raised one foot, for the same purpose. The terrace or platform may, however, be dispensed with, provided the floor of the house be raised sufficiently high by any other means; in which case three or four steps must be placed as an ascent to the door of the porch. When there is a platform, the door in the porch of the house is ascended by a half step of three inches, and the back door by a full step of six inches. The aspect of the porch is supposed to be south or south-east, as the best aspects, or, as the next best, south-west; the object being that a north and south line should form a diagonal to the square or parallelogram formed by the general mass of building; in consequence of which (as observed § 24.) the sun will shine on every side of the house during a portion of every day on which he appears. Three aspects are mentioned, in order that the one may be adopted which may be most suitable to the direction of the road near which the cottage is placed; the preference, however, should always be given to the south-east when practicable, as the wind, in most parts of Great Britain, blows seldomer from that quarter than from any other, and when it does blow it is always warm. The south-west is a boisterous quarter, and should only be had recourse to when it is necessary in order to obtain a diagonal to the plan which shall be a south and north line. We wish it to be distinctly understood, that it forms no part of our plan to have either the front or the back of the cottage next to, and parallel with, the road; on the contrary, we prefer, in almost every case of single cottages, to have next the road an angle of the building, by which the views across the road will be oblique instead of being direct; as the former, in every case, exhibits a longer perspective, which must consequently contain a greater number of objects. The grand point to be attended to in putting down every cottage, single or double, ought to be to have the diagonal to the main building a south and north line. This rule ought to be considered as absolute.

The floors of the models have all a gentle inclination, from the front door to the back door, of about three inches, so that no water can stand on any part of them; and the yards all slope to the tank for liquid manure, which is so low as to receive all the water of the yard. An underground drain surrounds the house and yard, three or four feet from the walls, as well for the purpose of cutting off the overflowings of the well or rain-water tank, as for keeping the floor of the house quite dry. To avert damp from the surface of the platform on which the house stands, and also of the back yard, gutters are fixed all round the eaves of the roof of the house; by which the water falling on it is collected and filtered, by some of the simple modes shown in the Encyclopædia (§ 30. and 305.), or by a still more simple mode which will be described hereafter, into a tank or well, from which it is drawn up by a pump placed in the back-kitchen, close to the sink. From the sink, which has a bell-trap to prevent the rising of smells, there may be a small drain or earthenware pipe to the liquid-manure tank; but a simpler and better mode is to have a tub or pail beneath the sink-stone, for collecting the water, which renders it obligatory to carry it from time to time direct to the privy, where it is necessarily poured through the pan into the liquid-manure tank, thereby making certain of keeping the pan constantly clean and not losing any of the liquid. The liquid is to be drawn from the tank by means of a well close to it, eighteen inches square, and of the same depth as the tank, and covered with a stone in which is a bell-trap to admit the water from the yard. When the liquid is to be taken up, this stone or lid must be taken off, and the liquid lifted by dipping a vessel into it; but the best mode is to have a pump in one angle of the well. Between the tank and the well there is an iron grating to prevent the escape from the tank of grosser impurities. It may be built of brick or stone, and either arched over, leaving a man-hole to be covered with a stone, or it may be covered with flag-stone; in either case covering the whole with a layer of earth, to prevent the possibility of the escape of smells. This tank will be described in detail in a future chapter.

The pit for solid manure may be four feet deep, and, if it be thought necessary, it may

be covered with a boarded shutter, hinged at half its width, which can be kept closely shut at all times, except when manure is being put in or taken out.

The principal difficulty which we feel we shall have with the cottager will be in convincing him of the importance of the liquid manure tank. We consider the liquid manure of a cottage as decidedly of more value to the garden than all the solid manure which the cottager is likely to be able to collect; and, therefore, in our opinion, wherever there is a garden to a cottage, there ought to be a liquid manure tank.

2238. *The Accommodation* in the model designs varies from three to six rooms; one or more of these rooms in the latter case being intended as a working-place for village mechanics, such as a tailor, shoemaker, weaver, &c. Besides these living and working rooms, there are, in each cottage, a small back-kitchen or wash-house, a pantry, a place for fuel, &c.; and in the agricultural cottages, except the lowest in the scale, a dairy and a pigsty. We have so arranged that the living-rooms in all the cottages may be heated by flues under the floor, proceeding from an oven or furnace in an outbuilding. We are aware that we shall have great difficulty in getting this arrangement adopted, but we introduce it because we consider it by far the most economical mode of applying fuel when that material is scarce, and, in particular, the only mode in which faggot-wood, slender branches, or spray, can be made the most of. This we have shown in the Encyclopædia, in § 34. and 35., p. 17. At the same time there are open fireplaces in the usual manner, to be used in conjunction with this mode of heating, or exclusive of it, for those by whom it is not approved of. Such persons, therefore, will merely consider the furnace to the flue as an oven for occasional use for baking; or, if the place is used as a poultry-house, for which it is well adapted, for communicating warmth to it.

2239. *Construction.* The materials with which these cottages may be constructed are not limited to any particular kind or kinds. Whatever is most abundant or cheapest in the locality where the cottage is to be built will be most suitable. In Britain, the most general material for walls is stone, and for covering roofs thatch. We have, therefore, shown the walls of sufficient thickness for being built of rubble stone; but if, in any part of the country, brick should be found cheaper, hollow walls of that material (see §. 25. 336. and 374.) may be adopted; or, in those parts of the country where the construction of cob walls, or walls of clay lumps, is properly understood and practised, no material can be better for cottages of this description. The roofs of most of the models we have supposed to be covered with thatch; because that material is found every where, and because in the common mode of putting it on by the use of layers of turves, instead of sewing, and by using turves also for the ridges and hips, it is both cheap and durable. We have known many roofs of this kind in Scotland which have lasted the length of a farmer's lease (nineteen or twenty-one years) without any repairs: the surface of the thatch becoming covered with growing moss excludes air and moisture, and prevents decomposition. In many parts of England, particularly in Sussex, instead of thatch, the chips made in working up coppice-wood, with or without spray, are used; and this makes a warm and durable roof, which might, perhaps, be rendered still more durable by steeping the chips in lime-water, or in Burnett's or some other preservative solution. The great advantage of roofs of thatch, chips, spray, or heath (which forms a common and most durable roof in the Highlands of Scotland), is, that they retain the heat of the rooms in winter, and exclude that of the sun in summer: but one disadvantage is their liability to be consumed by fire, which, however, rarely happens; and another, that, in the case of straw roofs, a quantity of material is lost, which might otherwise have been converted into manure. Those who disapprove of thatch may use tiles or slates, with a ceiling parallel to the sides of the roof about eighteen inches within it, so as to form, as it were, a double roof, which will, to a certain extent, answer the same purpose as a roof of thatch. The floors should slope gradually, that is, at the rate of one inch to seven feet, from the entrance porch, which should be the highest point, to the outer door of the back kitchen, which ought to be the lowest; in order that, when they are washed with a mop, the water may run before the operator, in whatever part of the house she may commence, towards the back door. The floors of the upper rooms may either be laid with boards, or with a composition of lime and clay, or lime and ashes, beaten smooth, in the manner to be hereafter described. This kind of bed-room floor is not uncommon in the East of England, particularly in Norfolk and Huntingdonshire, and also in Staffordshire. The height of the rooms on the ground floor should not be less than nine feet, nor should those in the roof be less in the middle, though at the sides they need not be more than five or six feet. The windows, where economy is the object, may be of cast iron, and either of the form used at Belper, or that recommended by the Highland Society of Scotland, both of which will be described in the chapter (v.) on construction.

2240. *The Elevations* to the models are wholly without ornament, unless facings or architraves to the doors and windows, a plinth to the walls, and a cornice to the

chimney tops can be considered as such; but we have given some ornamental elevation to the same plans, and others to plans having the same amount of accommodation.

2241. *The Gardens* we have shown as surrounding the cottages; being convinc that a garden does not afford half the enjoyment to the possessor, when it is separate from his dwelling, that it does when attached to and surrounding it; and that, though those portions of ground called cottage allotments are better than no garden at all, yet they are, and ever will be, very far from answering the end of gardens attached to dwellings. We have shown the garden to each cottage surrounded by a hedge, which ought generally to be seven feet high for the sake of privacy; and we have shown it cut architecturally, because we think the cottager ought to be encouraged by every means to show his taste in and about his garden, so as to win applause for his exertions. Indeed, we are of opinion that all garden hedges that are cut or clipped into regular forms ought to have piers at the angles and openings, and sometimes even pilasters at regular distances, terminating in balls or other forms: in other cases there may be arcades, open or recessed, and ornamented by verdant vases, or other objects that can be readily formed in living materials, at no other expense than that of a little labour with the hedge-shears. The planting, cropping, and culture of the garden, we think, should in general be left to the cottager, as otherwise he cannot take sufficient interest in it; assisting him with fruit trees, seeds, and ornamental plants, and with advice, or a suitable gardening book, if he require it. The extent of garden ground, in all ordinary cases, need not exceed one sixth of an acre, including the space occupied by the house and court-yard. A greater space than the sixth of an acre a labourer who has nearly constant employment cannot properly manage; and even this space, unless he has a large family, will admit of his occasionally producing articles for sale, whether vegetables, fruits, flowers, seedling plants, or seeds. We have shown, in the model designs, the gardens surrounded by hedges, as being cheaper than any other kind of fence; but we greatly prefer walls, as affording an opportunity of covering them with fruit trees and ornamental plants, and as not exhausting the soil.

2242. *The essential Requisites* for a comfortable labourer's cottage may be thus summed up:—

1. The cottage should be placed alongside a public road, as being more cheerful than a solitary situation; and in order that the cottager may enjoy the applause of the public when he has his garden in good order and keeping.

2. The cottage should be so placed that the sun may shine on every side of it every day throughout the year, when he is visible. For this reason, the front of the cottage can only be parallel to the public road in the case of roads in the direction of north-east, south-west, north-west, and south-east; in all other cases the front must be placed obliquely to the road, which, as we have previously shown, is greatly preferable to having the front parallel to the road. (See § 2237.)

3. Every cottage ought to have the floor elevated, that it may be dry; the walls double or hollow, or battened, or not less than eighteen inches thick, that they may retain heat; with a course of slate or flagstone, or tiles, bedded in cement, six inches above the surface, to prevent the rising of damp; the roof thick, or double, for the sake of warmth; and projecting eighteen inches or two feet at the eaves, in order to keep the walls dry, and to check the radiation of heat from their exterior surface.

4. In general, every cottage ought to be two stories high, so that the sleeping-rooms may not be on the ground floor, and the ground-floor ought not to be less than from six inches to one foot above the outer surface.

5. The minimum of accommodation ought to be a kitchen or living-room, a back-kitchen or wash-house, and a pantry, on the ground floor, with three bed-rooms over; or two rooms and a wash-house on the ground floor, and two bed-rooms over.

6. Every cottage, including its garden, yard, &c., ought to occupy not less than one sixth of an acre; and the garden ought to surround the cottage, or at all events to extend both before and behind. In general, there ought to be a front garden and a back yard; the latter being entered from the back-kitchen, and containing a privy, liquid-manure tank, place for dust and ashes, and place for fuel.

7. If practicable, every cottage ought to stand singly and surrounded by its garden; or, at all events, not more than two cottages ought to be joined together. Among other important arguments in favour of this arrangement, it may be mentioned, that it is the only one by which the sun can shine every day on every side of the cottage. When cottages are joined together in a row, unless that row is in a diagonal direction, with reference to a south and north line, the sun will shine chiefly on one side. By having cottages singly or in pairs, they may always be placed along any road, in such a manner that the sun may shine on every side of them; provided the point be given up of having the front parallel to the road; a point which, in our opinion, ought not for a moment to be put in competition with the advantages of an equal diffusion of sunshine.

8. Every cottage ought to have an entrance porch for containing the labourer's tools, and into which, if possible, the stairs ought to open, in order that the bed-rooms may be communicated with without passing through the front or back kitchen. This, in the case of sickness, is very desirable; and also in the case of deaths, as the remains may be carried down stairs while the family are in the front room.

9. The door to the front kitchen or best room should open from the porch and not from the back-kitchen, which, as it contains the cooking utensils and washing-apparatus, can never be fit for being passed through by a stranger, or even the master of the family, where proper regard is had by the mistress to cleanliness and delicacy.

10. When there is not a supply of clear water from a spring adjoining the cottage, or from some other efficient source, then there ought to be a well or tank partly under the floor of the back-kitchen supplied from the roof, with a pump in the back-kitchen for drawing it up for use, as hereafter described in detail. The advantages of having the tank or well under the back-kitchen are, that it will be secure from frost, and that the labour of carrying water will be avoided.

11. The privy should always be separated from the dwelling, unless it is a proper water-closet, with a soil pipe communicating with a distant liquid-manure tank or cesspool. When detached, the privy should be over or adjoining a liquid-manure tank, in which a straight tube from the bottom of the basin ought to terminate; by which means the soil basin may always be kept clean by pouring down the common slops of the house. No surface being left from which smell can arise, except that of the area of the pipe, the double flap, to be hereafter described, will prevent the escape of the evaporation from this small surface, and also insure a dry and clean seat.

12. The situation of the liquid-manure tank should be as far as possible from that of the filtered water tank or clear water well. It should be covered by an air-tight cover of flag-stone, and have a narrow well adjoining, into which the liquid should filter through a grating, so as to be pumped up or taken away without grosser impurities, and in this state applied to the soil about growing crops.

13. In general, proprietors ought not to intrust the erection of labourers' cottages on their estates to the farmers, as it is chiefly owing to this practice that so many wretched hovels exist in the best cultivated districts of Scotland and in Northumberland.

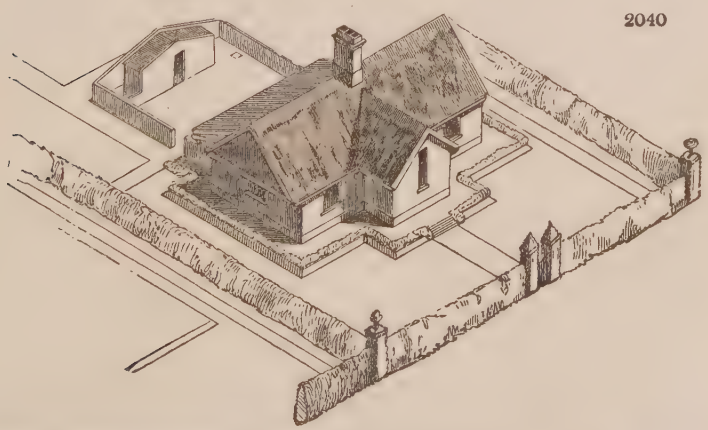
14. No landed proprietor, as we think, ought to charge more for the land on which cottages are built than he would receive for it from a farmer, if let as part of a farm; and no more rent ought to be charged for the cost of building the cottage and enclosing the garden than the same sum would yield if invested in land, or, at all events, not more than can be obtained by government securities.

15. Most of these conditions are laid down on the supposition that the intended builder of the cottage is actuated more by feelings of human sympathy than by a desire to make money; and hence they are addressed to the wealthy, and especially to the proprietors of land and extensive manufactories or mines.

Subsect. 1. *Agriculturist's Model Cottage.*—No. I.

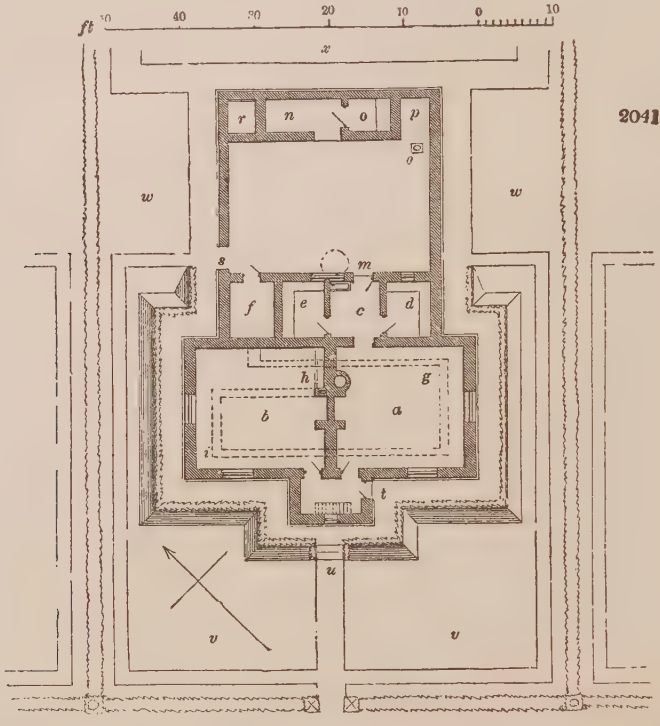
The elevation of this cottage is shown in fig. 2040

2040



2243. *The Accommodation* in this cottage is the lowest in the scale, and may be considered as offering the first stage of improvement, in departing from those agricultural

hovels in the South of Scotland and North of England which at present consist only of a single room. (§ 2233.) In this model we have two rooms, each seventeen feet square, a back-kitchen or wash-house, and two garrets of the same size as the rooms over them. The access to these garrets is by a step-ladder in the porch. The garrets may be used as sleeping-places, the one for grown-up girls or a female lodger, or both; and the other for grown-up boys or a male lodger, or for both. The bed for the master and mistress, and the bed or cradle for the infant children, may be in the best room on the ground floor. The details, as shown in fig. 2041., are as follow:—*a* is the kitchen, seven-



2041

teen feet square, containing a boiler at one side of the fireplace, and, if necessary, an oven may be placed at the other; *b*, the best room, in which is a closet or press, *h*, and room for two beds; *c* is the back-kitchen, with a sink and pump; *d*, the pantry; *e*, the dairy, or place for beer, &c.; and *f*, a place for an oven, for occasional baking, and to heat the floors of the two rooms, as indicated by the dotted lines *g*. Should an oven not be wanted, or this mode of heating not be approved of, then this compartment may be used for containing fuel or roots, poultry or rabbits, or for any other purpose that may be wanted. The highest point of the sleeping-room floor is at *i*, and of the kitchen floor at *g*; the highest point of the pantry floor is at *d*, and of the dairy floor at *e*; and from these four points the floors gradually slope, at the rate of one inch to seven feet, to the sill of the back-kitchen door at *m*. A place for wood or other fuel, or for a pig or rabbits, according to the taste or circumstances of the occupant, is shown at *n*, a privy at *o*, a tank for liquid manure communicating with the privy at *p*, a place for pumping or lifting out the liquid manure at *q*, and a pit for solid manure at *r*. The surface of the yard slopes from the entrance-door, *s*, to the liquid-manure pump, *q*; and the door to the back-kitchen, and the door to the porch in front, at *t*, are each entered by a step. The terrace platform is entered by three steps, as at *u*. In the front garden are two plots, *v v*, which may be planted with low fruit trees or fruit shrubs; and there are two other plots at *w w*, which may be planted with standard fruit trees to shade and shelter the back court: *x* shows the commencement of that part of the garden where culinary vegetables are supposed to be growing. The narrow borders, walks, the low box hedge to the parapet, and the boundary hedge, require no explanation.

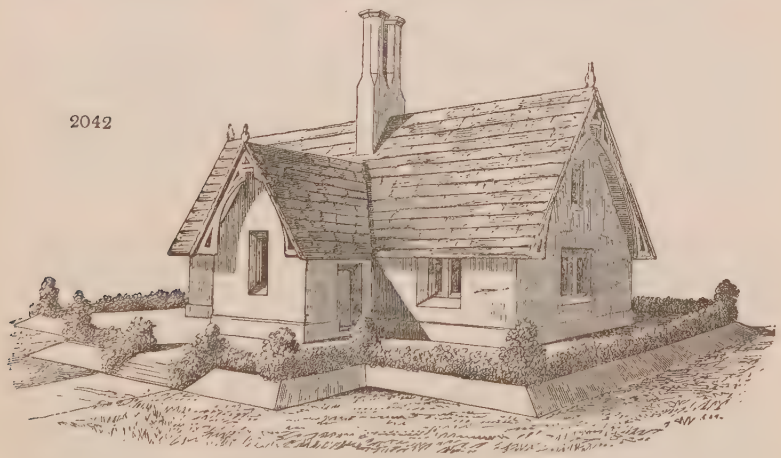
2244. *Construction and Materials.* The walls are supposed to be of rubble stone, or

of prepared earth, and the roof of thatch. The floor of the kitchen is to be paved with stone or brick, or, at all events, the flues are to be covered with these materials, and the rest of the floor of composition of lime and clay, or of lime and smithy ashes, or of whatever may be cheapest and best in the given locality. The floor of the best room, if heated by a flue beneath, may be of the same material as that of the kitchen; but if not heated by a flue, then it ought to be of boards.

2245. *The Garden* is only partially shown, the portion omitted being a parallelogram of the breadth indicated, and of sufficient length to make the contents of the whole plot one sixth of an acre. It is surrounded by a thorn or holly hedge. The slope of the terrace or platform may be covered with small stones, flints, or any other similar material most abundant in the country, as requiring less labour to keep it in order than turf: or it may be planted with chamomile or lavender, for the sake of the flowers, which may be collected and sold; with low creeping ornamental plants, such as ivy or periwinkle; or with thyme, heath, or some other low flowering plant, for the sake of the bees. The best effect, however, will be produced by covering it with the same kind of stone or brick as is used in the walls of the house. No shrubs are proposed to be trained against the walls of the house, except a vine, an apricot, or a pear, at each end, according to the climate; but a border six inches wide is shown close to the wall of the house, in which may be planted a few China roses and some early flowers; while currants, morello cherries, or apples, may be trained on the outside of the walls of the court-yard. The narrow borders next the hedge may also be planted with flowers; and the larger compartments with gooseberries, currants, and dwarf apple trees. The culinary crops are proposed to be grown in the back compartment, the commencement only of which is shown in the plan.

2246. *General Estimate.* The cubic contents are 10,163 feet, which, at 2*d.* per foot, is £84; at 1*d.*, £42; and the actual cost would not, it is believed, amount to much more than the latter sum. As a proof of this we refer to § 2263.

2042



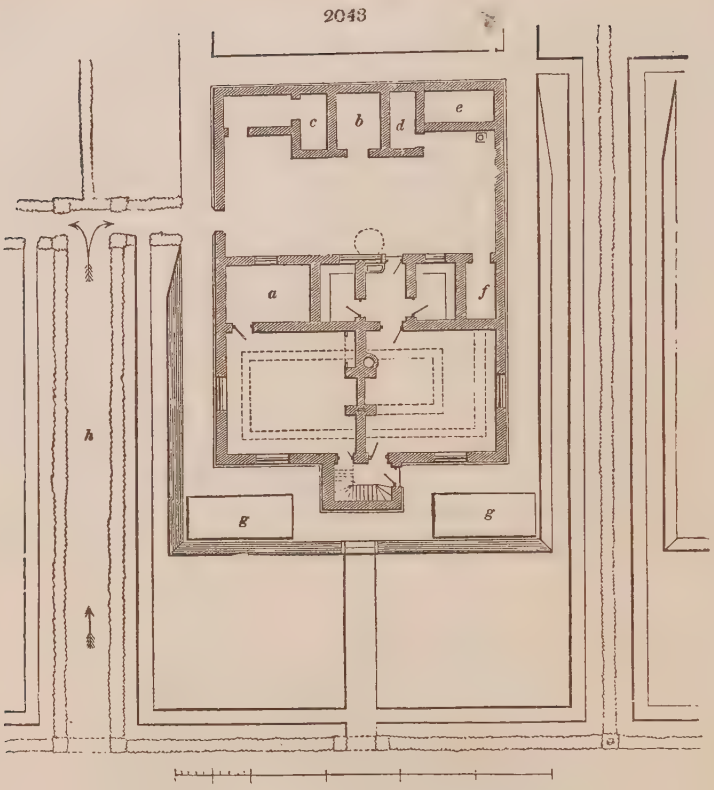
2247. *Remarks.* The idea of this model cottage was suggested to us by the plan of the Closeburn cottage, given in next section. It may be lowered in its accommodation by omitting the bed-rooms in the roof, and making the porch narrower and without a step-ladder. If the places for the oven or the dairy are not wanted, they may be added as closets, the one to the kitchen and the other to the bed-room, by opening doors in the back wall. An oven might be added to the kitchen fireplace on the opposite side to the boiler. All the divisions in the lean-to behind, which now form the pantry, dairy, back-kitchen, &c., might be enlarged by continuing the lean-to the whole length of the house. Fig. 2042. is an elevation with a slate roof for this plan, by Mr. Lamb.

Subsect. 2. *Agriculturist's Model Cottage.*—No. II.

The elevation of this design is shown in fig. 2044., and a variation of it in fig. 2045.

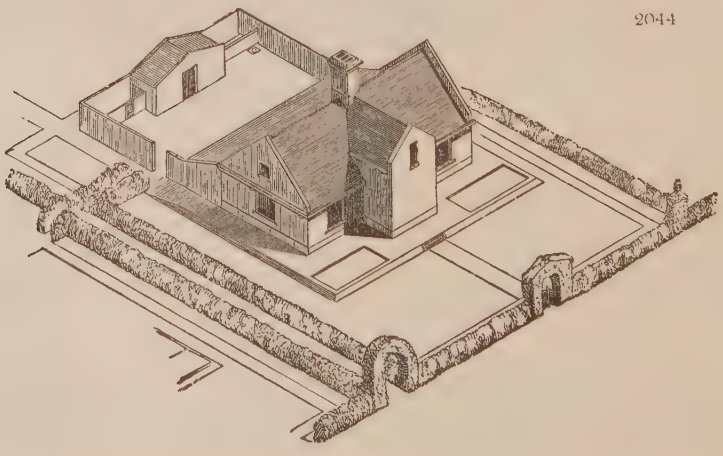
2248. *Accommodation.* Here we have obtained one good room, fig. 2043. *a*, instead of the cow-house and pigsty. This, with two bed-rooms over the two principal rooms, will form a very commodious cottage, and enable the occupant to let out a room to a lodger

2043

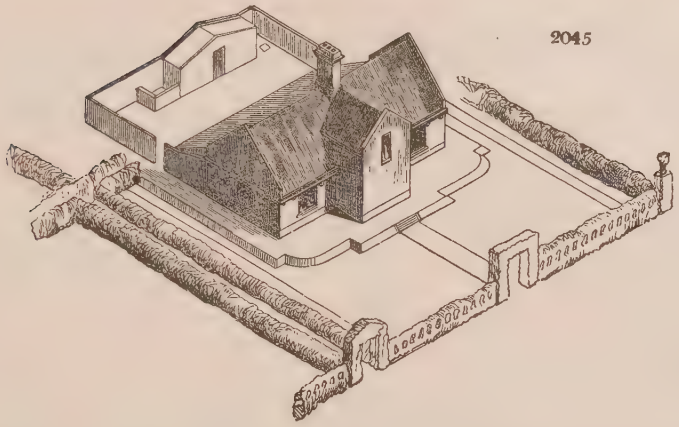


The cow-house, *b*, and pigsty, *c*, are separated from the house, and placed along with the other buildings in the yard. There are a privy, *d*; liquid-manure tank, *e*; poultry-house for heating the floor, *f*; two flower-beds, *g g*; and a passage to the back-yard, for the cow, &c., serving for two cottages, *h*.

2044



2045

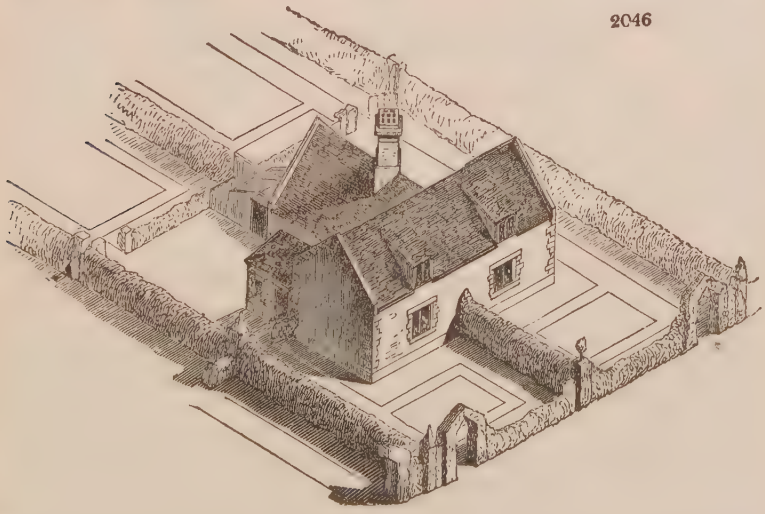


2249. *Remarks.* When the cow-house and pigsty are not wanted, they may be united, and by opening a door in the parlour they may form a bed-room or work-room communicating with it, and lighted by a window either at the end or at the back. This may also be done with the dairy and oven rooms, should they not be wanted; so that, by this means, two additional rooms may be obtained on the ground floor.

Subsect. 3. *Mechanic's Model Cottage.*

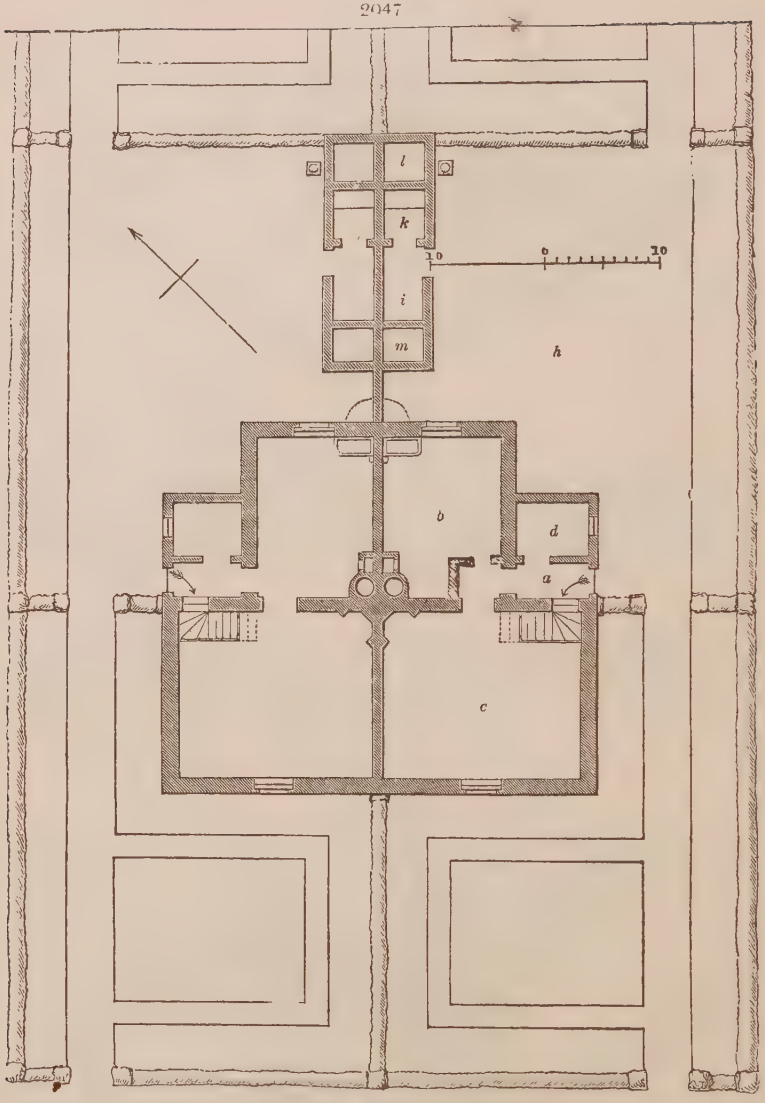
2250. *The Mechanic's Model Cottage* may be built singly, but the most economical arrangement is obtained by building them in pairs, as in fig. 2046. For the idea of this model we are indebted to Thomas Wilson, Esq., of the Banks near Barnsley, who sent us the design, fig. 2048., on which our draftsman, Mr. Marks, made the improvement, with a view to economy in building, shown in fig. 2049., which being sent to Mr.

2046



Wilson, he completed the work by changing the entrance to the stair from the back-room to the porch, as in fig. 2050., the advantages of which, to use his own words, "are great: the sitting-room is altogether private; and, in case of illness, there is an obvious gain in not having to pass through the house from a sick-room. There is another point not usually considered: when an inmate has to be removed to his last home, the pre-

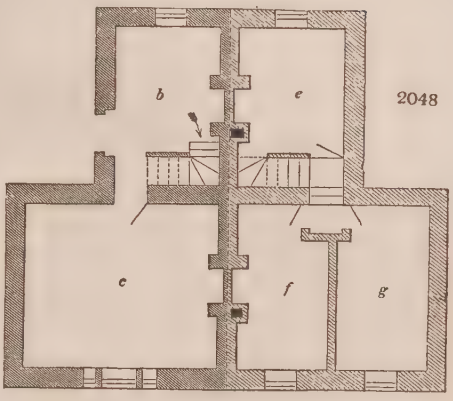
2047



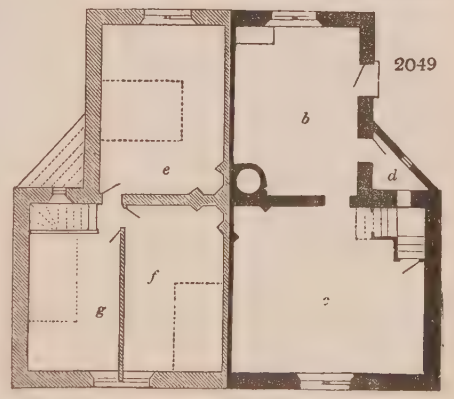
parations, and particularly the carrying down stairs, would by this arrangement of the stair, all be accomplished while the family were in the sitting-room. In cottages as they are at present built, that which is never accomplished without difficulty, is almost always rendered scarcely practicable by the narrowness and awkwardness of the stairs. No architect of feeling should overlook this." In fig. 2047. *a* is the porch into which the staircase opens; *b* is the back-kitchen, with a pump and sink-stone, arranged in connexion with a tank or well, as in the agriculturist's model cottage; *c* is the principal room; *d*, a pantry; and there is a light closet under the stair, *e*, in fig. 2050. There are three bed-rooms shown in the plan of the adjoining cottage at *e*, *f*, *g*, in fig. 2048. In the back-yard, *h*, there is a place for fuel, *i*; a privy, *k*; a liquid-manure tank, *l*; and place for ashes, &c., *m*. The gardens may be arranged as in the figure, or in any other mode that is considered most convenient. The isometrical elevation of fig. 2047. is shown in fig. 2046.

2251. *General Estimate.* The cubic contents of the two cottages are 15,200 feet, at 6*d.* per foot, £380; at 4*d.*, £253; at 3*d.*, £190; and at 2*d.*, £126; or for each cottage, £190, £126, £95, and £63.

2252. *Remarks.* Our readers, we are sure, will agree with us in thanking Mr. Wilson for his most economical and commodious plan, and for his very humane and feeling observations respecting it. We consider the design, finally improved, as uniting more comfort at less expense than any other given in this Supplement. The only drawback to the arrangement that we know is, that it is necessary to pass through the back-kitchen in order to enter the best room; but this might be remedied, either by enlarging the porch, or by adding a porch in front. In either case additional expense would be incurred. Where comfort is more the object than expense, we would recommend the fireplaces not to be placed in the angles, but back to back, as in fig. 2048., by which more room is obtained for persons sitting round the fire, and the heat is more equally radiated through the room. For the sake of economy we have shown dormer windows in the elevation, fig. 2051., and also in the isometrical view; but where economy is not an object, we would prefer having the side walls as high as the tops of the windows. A cottage of this form may be rendered highly ornamental by enlarging the parlour window, and projecting it with a bay; by forming two separate windows to the principal bed-rooms, ornamenting the gables, and forming a group of columnar chimneys. It might even be rendered more artistical by simply splaying the jambs of the doors and windows, slightly rounding their upper angles, and either raising the side walls so as not to have the windows in the roof, or retaining them in the roof and finishing them with pediments and span-roofs.



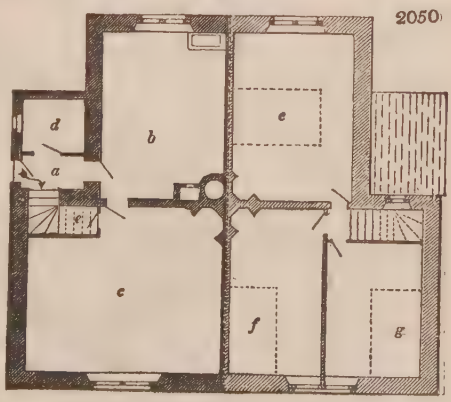
2048



2049

As this design is not shown placed on a platform, it is peculiarly suitable for having the walls covered with ornamental shrubs, such as climbing roses, honeysuckles, clematises, chimonanthus, and Virginian creeper; or with fruit trees or vines.

All the ornamental climbers which have been mentioned, with the exception of chimonanthus, may be planted about two feet apart, and trained in direct lines from the ground to the eaves; but the chimonanthus, being a woody plant, should be trained



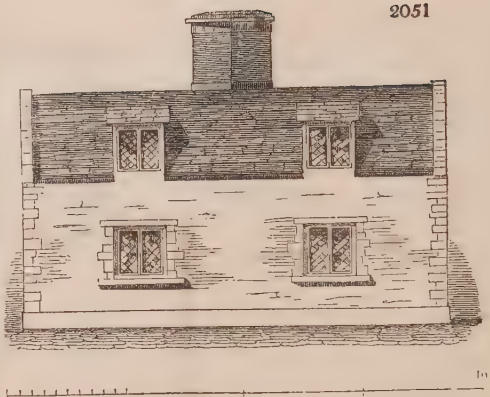
2050

more in the fan manner practised with plums, peaches and apricots.

The fruit trees should be trained differently, according to their kinds: the pear and the apple horizontally; the plum, cherry, apricot, and peach, in the fan manner; and the gooseberry and currant perpendicularly, one shoot only, or at most two, being carried up from each plant.

The vine may be trained in the perpendicular manner, placing the plants at two feet apart, retaining only one shoot to each plant, and obtaining the bearing wood by spurring in that shoot: but

2051



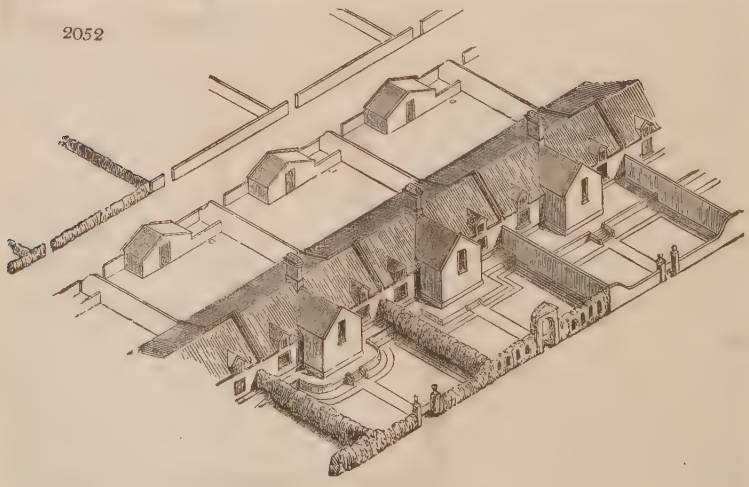
the best mode of training the vine against a house is to have the main branches of every plant in the form of the letter T, and to train the bearing branches upwards from the two horizontal arms, in the manner practised at Thomery near Fontainebleau, on the houses in Stockbridge and Broughton in Hampshire, and in the vineyard of Mr. Hoare at Southampton. These hints on training trees against the walls of cottages will be sufficient for any one who knows a little of gardening; for those who do not, we would recommend the *Suburban Horticulturist*, in which the subject of training trees is treated in detail, and more especially the training of vines against cottages.

With respect to the propriety of training fruit trees against cottages, much depends on the climate and aspect. We cannot recommend it as a general practice in a wet climate, because it would have a tendency to keep the walls damp after rain was driven against them; nor on cottages that have one side to the south, and another to the north, except on the south side, because on the north side fruit trees would do little good, and any other description of deciduous plant would prevent the evaporation of the rain driven against them from the north. On the walls of all cottages placed with their diagonal line in the direction of south and north, trees may be trained on every side, without danger of producing damp, as every side would enjoy sun.

Subsect. 4. *Placing the Model Cottages in Rows.*

2253. *The Agriculturist's Model Cottage* may be placed in rows in the manner shown in fig. 2052.; in which the entrance to the yards being from a back passage, and the

2052



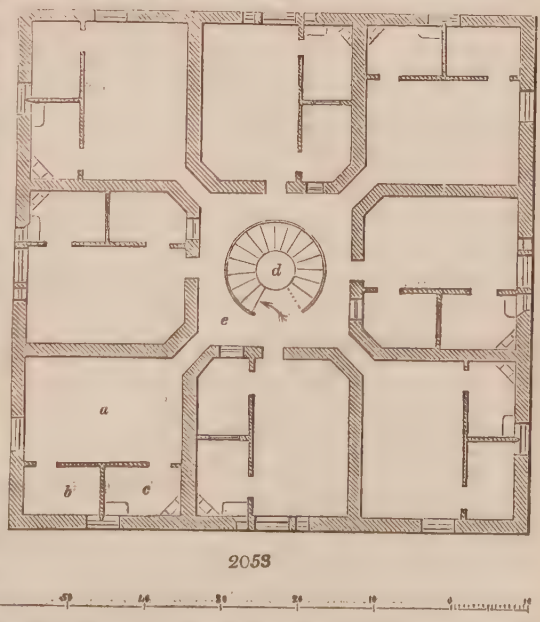
public road being in front, the kitchen-garden to each cottage will be most conveniently placed behind, on account of the manure, and especially the liquid manure; which, if the kitchen-gardens were in front, would either have to be carried through the house, or a good way round.

2254. *The Mechanics' Model Cottages* may be placed in rows, in contact, by the addition of a front porch to each cottage; but much the best mode for this style of cottage is to have them in pairs, as already shown in fig. 2047.

2255. *Remarks.* The objections to placing these cottages in contact in rows are, that it lessens the privacy of each dwelling, and in many cases would prevent the sun from shining on every side of them. It is a great source of independence and comfort for a cottager, to be completely surrounded by his own garden. It is not pleasant, when walking or working in our garden, to be overlooked by our neighbour; or, when sitting quietly in the house, to hear the sounds of his children through the party-walls. It is a great mistake to suppose that this feeling is confined to the educated part of society: it exists among all classes, and certainly much more strongly among persons accustomed to a comparatively solitary life in the country, like agriculturists, than among mechanics accustomed to live in streets. Where cottages of this kind are joined in rows, and indeed in every case of cottages being joined, we would recommend building the party-walls thicker than usual, and having the garden walls or hedges seven feet high, with here and there a standard fruit tree in them, to break the view from the bed-rooms of the adjoining dwellings.

Subsect. 5. *Forming Combinations of Dwellings of the humblest Class.*

2256. In the Encyclopædia (§ 493.), we have shown with what economy combinations of dwellings might be built, and how greatly the comforts of the individuals occupying them might, in various ways, be increased by cooperation. It does not appear, however, that mankind is yet in a fit state for entering on this stage in the progress of improvement. To be able to do so men must have been educated from infancy to live in society; and when this shall have been the case, then the increase of comforts and enjoyments that may be obtained by living together in masses will be duly appreciated by themselves. In the meantime, the working classes of society, in common with every other class, appear to us to have a much greater taste for isolation than for cooperation; more particularly in every thing relating to domestic arrangements. In short, we are inclined to think that little good will be effected by arrangements of this kind, till those classes for which they are intended, in consequence of superior education, see themselves the benefits which would accrue from them. They will then endeavour to procure their establishment.



2053

2257. *A College for single Working Men.* The only addition that we shall make to what we have already advanced on this subject is a design, fig. 2053., taken from one which we made in 1819, and published in the *Mechanic's Magazine*, vol. xvi., for what may be called a college for single working men. Each floor will contain eight distinct dwellings, and each dwelling will consist of a living-room twenty-one feet by thirteen feet, *a*; sleeping-room, ten feet by seven *b*; and washing-room, with a sink and water-closet, ten feet by seven *c*; the circular stair is shown at *d*, and the landing to each floor at *e*.

The building is supposed to be of a cubical form, of eight or ten stories high, with staircase in the centre, and a series of fire-proof rooms on each floor, communicating with a common gallery.

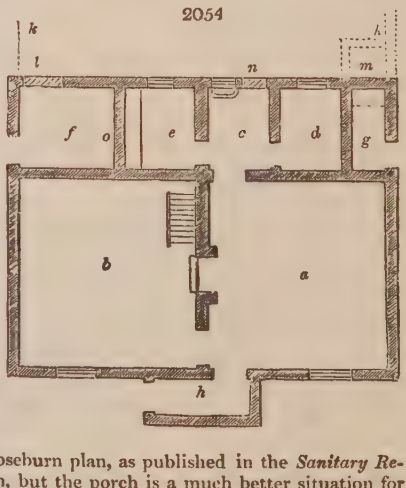
The whole building we propose to be heated from one stove at the bottom of the stairs; and in each separate apartment might be placed two jets of gas for cooking, and one for lighting. As there would be a gas-meter to each apartment, no individual would pay for more gas than what he consumed. The floorings of all the rooms would be of flag-stone, the under side of which would form the ceiling to the room below; and as all the partitions would be of brickwork, or might also be of flag-stone, the first cost of the building would be comparatively low, and the expense of repair very trifling. On the lowest floor a house-keeper might reside, who would have the general charge of the building, and who, if it were thought advisable, might lay in a stock of such articles as were generally wanted by the occupants, and retail them to them at nearly cost price. There might also be a restaurateur and dining-room on the ground floor, arranged so as to supply food on the most economical terms. The building, however, would be chiefly valuable as supplying lodgings of the most comfortable kind at a very moderate expense. As no fires would be wanted in the different rooms, there would be no occasion for fuel, which would be a great saving both of labour and expense; and as water would be laid on to every apartment, to which also there would be a water-closet for waste water, the labour of cleaning would be reduced to a mere trifle. In short, for large towns, there could hardly be a more economical and comfortable mode of lodging single men, such as clerks, shopmen, working mechanics and artisans of every description, and even literary men and artists.

Sect. II. *A Selection of Plans of Cottages which have been erected in different Parts of the Country.*

2258. *This Selection* of plans is chiefly taken from the *Sanitary Report of the Poor Law Commissioners for* 1842, which contains the best plans which the commissioners could procure from their correspondents in every part of the country. We have only given the plans, because the elevations have no particular merit; and the plans are, in our opinion, defective in not in general showing the relative situation of the back-yard and appendages, and of the garden ground. On the situation of both these depends much of the comfort and beauty of every country dwelling, from the palace to the cottage; and yet, in most cases, when cottages are put down, the situation and arrangement of the garden are commonly left to chance. The garden, whenever it is practicable, ought to surround the cottage, and the boundary ought always to be clearly defined by a hedge or wall. Whatever be the direction of the road before the cottage, the cottage ought always to front the south-east if possible, if not the south-west. There is no comfort in a cottage in our cold moist climate when it fronts either the direct south or the direct north; because, in either case, one side must be in the shade for half the year.

2259. *The Closeburn Cottage.*—Several of these cottages have been erected by Sir Charles Stuart Menteath, one of the most enlightened and benevolent men of his time and country, at Closeburn in Dumfriesshire. Fig. 2054. shows the plan of the Closeburn cottage, in which *a* is the kitchen, sixteen feet square and eight feet high; *b*, the sleeping-room, of the same dimensions; *c*, the back-kitchen, with a sink; *d*, the dairy; *e*, the pantry; *f*, the cow-house; *g*, the privy; and *h*, a porch, in which there may be a step-ladder to the garrets, if these are used as bed-rooms. In the Closeburn plan, as published in the *Sanitary Report*, the stairs are shown in the bed-room, but the porch is a much better situation for them. The sleeping-room, *b*, may be warmed by having a sheet-iron back to the kitchen fireplace, interposing a flag-stone or some bricks between it and the flue, to prevent the sheet-iron from being too much heated. In the summer season the heat may be

2054



kept from entering the room by enclosing the iron plate with a case or box of boards. If there should be bed-rooms over the two lower rooms, these may also be heated by air warmed in the recess at the back of the kitchen fire, by the following arrangement: —

Fig. 2055. is a ground plan of the kitchen fireplace and iron box, in which *a* is the fireplace; *b*, the orifice by which air is admitted to the iron box by means of the under-ground tube or drain, *c*; and *d*, a wooden box for enclosing the iron box in the summer season, when heat is not wanted in the room, or when it is desired to enclose articles to keep them warm, or to dry clothes in Mr. Sylvester's manner. (§ 306. and 2053.)

2055

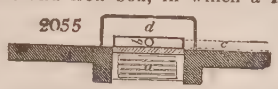


Fig. 2056. is a section through the kitchen fireplace and the iron box, in which *e* is the orifice of the cold-air tube; *f*, the iron box; *g*, the wooden box; *h*, the tube for conveying hot air to the bed-rooms; and *i*, the kitchen fireplace and flue. When the air is not wanted for the bed-rooms, it might be convenient to be able to let it escape by turning it into another flue, which might be added to the stack of chimneys; but, if care is taken to open the bed-room windows a little, the escape of the air through them would be advantageous, even in the summer season.

2056

Sir Charles Menteath's son, J. S. Menteath, Esq., in answer to our enquiries as to how this plan was found to work in practice, says: "I consider the introduction of these iron plates into our cottages, whereby two apartments are most economically and most comfortably warmed by one fire, as among my father's most valuable, and most benevolent attempts to make our cottagers happy and healthful." Were we called upon to improve this cottage, we would enclose a small yard behind, the commencement of which is indicated by the dotted lines at *k*, *k*, in fig. 2054.; make the door of the cow-house open from the yard, as indicated at *l*; place a liquid manure tank behind the privy, as indicated at *m*; open a door from the back-kitchen to the yard, as at *n*; and place the whole on a platform, and surround it with a garden, as in fig. 2040. in p. 1131. It is probable that some of these improvements may actually exist; but they are not shown in the plan, or in a model which, in 1840, at the request of Sir Charles Menteath, we placed in the Adelaide Gallery.

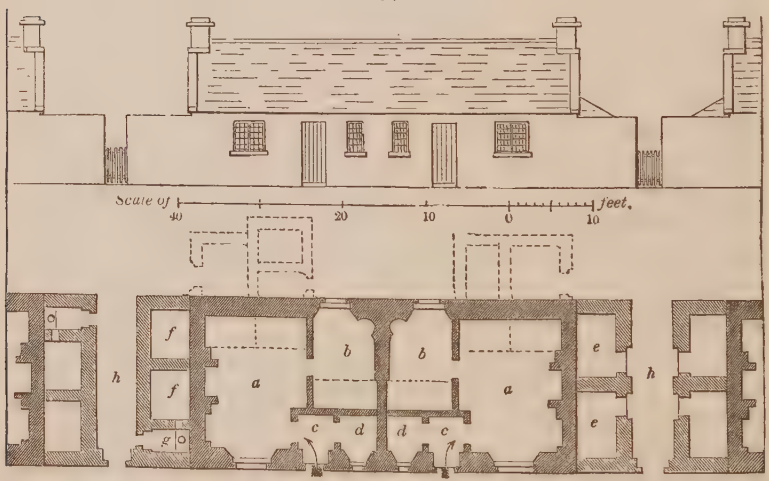
2260. *The Dalmeny Cottage*, fig. 2057.—This cottage has been erected by Lord Roseberry on his estates in the neighbourhood of Edinburgh, and has been justly considered, by the Highland Society and other competent judges, as a considerable improvement on the habitations for country labourers as they now exist in most parts of Scotland. The custom of having cottages of only one story, and of only two rooms, and of having box beds (see § 658. 1338.) in the kitchen as well as in the other rooms, is general in Scotland; but it is evident that no great improvement can take place in the habits of the people till they have back-kitchens for their cooking and washing utensils, and till their beds are removed from their living-rooms. The very circumstance, as we have observed (§ 1338.), of having to go up stairs to a bed-room is favourable to delicacy, cleanliness, and health. Nevertheless, Lord Roseberry's cottage is a great improvement on the kind of ploughman's cottage common in the neighbourhood of Edinburgh; and as such we have considered it desirable to republish here the plan and specification as given in the *Transactions of the Highland Society of Scotland*, vol. xii. p. 527.

2261. *Specification.* The following is published in the work above referred to: — "The walls to be of the best rubble-work, founded with large flat stones, and all well packed and pointed with properly prepared lime mortar. The rebates, soles, and lintels for doors and windows, to be droved on the head and cheek, and broached on the breast. Corners to have broached stone; and both corners and rebates to be of a proper size, and square-tailed; the skews to be broached on the top, and droved on the edges, with a proper raglin for the tile; the chimney tops to be of broached stone, with droved water berge, plinth, and cope; the jambs, lintels, and hearths of fireplaces to be of droved stone, and the vents made 12 inches by 13 inches, and plastered with haired lime. The partitions to be of stone and standard, the standards to be 4½ inches by 2 inches, placed 2 feet apart upon a sill-plate, laid on a proper stone footing; all between standards to be filled in with small flat stones, bedded and jointed with lime, and to have warpings 4½ inches by three fourths of an inch, every 2 feet in height, nailed to standards. The floors of porches and privies to be laid with scabbled stone flags; all the other floors to be laid with a composition of lime and engine ashes, in proper proportions, well riddled, tempered, worked, laid 3 inches thick, smoothed, and well rubbed in; under the composition, 9 inches in depth of small broken stones to be laid, the earth being first excavated

to admit of their being put in. The floors of ash-pits and soil-pit in privies to be kept 18 inches lower than floors of cottages, and an opening made in wall from soil to ash-pit.

"The safe lintels for doors and windows to be of 11-inch by 3-inch red Petersburg plank, with 9 inches wall-hold at each end, the whole space covered and saved by a hammer-dressed stone arch where there is room. Wall-plates to be of single battens, 7 inches by 1 inch and a quarter. The rafters and balks of cottage roofs to be of Memel, the size marked in the section, or of red Dram battens $6\frac{1}{2}$ inches by $2\frac{1}{2}$ inches, placed 20 inches from centres, and the balks half-cheeked to rafters with double-garron nails, three in each joining. The roofs of coal-places and privy to be of the lean-to kind; rafters 4 inches by 2 inches, cheeked to wall-plates at toes, and let 9 inches into wall at top. Tile lath to be 1 inch and a quarter by 1 inch and five eighths each, cut out of red Petersburg batten. The windows to be made of Memel, in the sliding manner, sashes $2\frac{1}{8}$ inches thick, well glazed, primed, and bedded in and drawn up with line; the windows of kitchen and room to have counter-cheek screws and plain deal shutters, barred and beaded on inside; the pantry window to be hinged, and to fasten by an iron button, with ring, &c. The outside doors of cottages, places for coals, and privy, to be of plain deal, 1 inch and one eighth thick, cut out of red Petersburg batten, three bars on the back, hung on crooks and bands; coal-place and cottage doors to have stock-locks of 4*s.* 6*d.* value, and strong thumb-latches; privy doors, a thumb-latch and iron bolt on inside. The inside doors to be also of plain deal, barred and beaded, hung with 13-inch T bands upon door standards of red Dram batten 6 inches by $2\frac{1}{2}$ inches, and all to have plain beaded facings and keps, to have neat thumb-latches, and the press and pantry 2*s.* press-locks. All angles to have $\frac{3}{4}$-inch beads; and ceilings of cottages lathed with best split lath. The pantries and presses to have three shelves each. A hatchway to be made in ceiling of porch, with hinged cover. The privy to have a properly formed seat of $1\frac{1}{8}$-inch timber. The inside doors, window-shutters, and other inside finishing, may be of yellow American pine or white plank; all the other timbers to be of the best red wood, of Baltic growth. The roofs to be covered with grey or red tile, rendered with lime. The walls of cottages to get one coat of plaster, the ceilings two coats, and well finished." (*H. Trans.*, vol. xii p. 534.)

2057



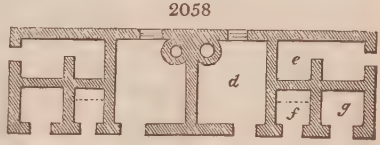
2262. *Accommodation.* The cottages are built in pairs, and each consists of a porch, *c*; a kitchen, *a*, sixteen feet by twelve feet three inches, in which are two beds; a bed-room, *b*, eleven feet six inches by seven feet, containing one bed; a pantry, *d*, four feet by four feet and a half; and, as appendages, a privy and a place for fuel, *e e*, and an ash-pit. In general, these appendages are placed at one end, but they might be placed behind, as shown by the dotted lines; and sometimes there may be at the end a shed for fuel; a place for potatoes or other roots, or for poultry or a pig, *f f*; with a privy, *g*; and the place for ashes at the back, as indicated by the dotted lines. The gardens to these cottages are placed there; and there is a passage through to them between each pair of cottages, as shown at *h*, *h*.

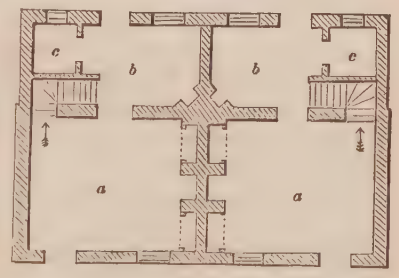
2263. *General Estimate.* Cubic contents, 14,100 feet, at 6*d.* per foot, £352; at 4*d.*, £235; at 3*d.*, £176; at 2*d.*, £117; or for each cottage, £176, £117, £88, or £58. The actual cost of these cottages, it is stated in the work referred to, was generally from £75 to £85 a pair. We have given the general estimate in this case and some others, to show that for cottages of the simplest kind 2*d.* per cubic foot is much more likely to be above than under the actual cost.

2264. *Remarks.* The Dalmeny cottages are certainly a step in advance of the common cottages of Scotland, where a taste for comfortable dwellings and for cleanliness is just beginning to be cultivated. The improvements which may be made in them are, the addition of a back-kitchen, which we consider indispensable to comfort, and the detachment of the privies, and their connexion with liquid manure tanks, as shown in our model designs; but, as most farmers in Scotland are not sufficiently aware of the great value of liquid manure, it is not to be expeeted that their labourers can set a due value upon it. Something ought to be done, however, to introduce these tanks, for the sake of the great additional garden produce that would be obtained by the use of their contents. We have generally found it easier to introduce a taste for ornamental appendages to a cottage, than for improvements or changes which are merely useful; but the former, we also find, seldom fail to pave the way for the latter. We would, therefore, have front gardens added to these cottages, solely for the cultivation of flowers and flowering shrubs; and we would add porches, and either surround the front gardens with low walls, or with hedges cut architecturally, or formed in some way that would call forth the skill and taste of the occupant in managing them.

2265. *The Holkham Cottage*, fig. 2058. — Some of the cottages of the Earl of Leicester, it is stated in the *Sanitary Report*, "are perhaps the most substantial and comfortable that are to be seen in any part of England." They are built in pairs, or in groups of four cottages. The accommodation of a single dwelling consists of a front room, *a*, seventeen feet by twelve feet in width, and from seven feet to seven feet six inches high; a back-kitchen, *b*, thirteen feet by nine feet, and of the same height; a pantry, *c*; and, on the floor above, three bed-rooms. Behind is a wash-house, *d*; a dirt-bin, *e*; a privy, *f*, and a pig-cot, *g*. The drainage is excellent, and the water from a pump-well good, and each cottage has about twenty rods (an eighth of an acre) of garden ground.

2058



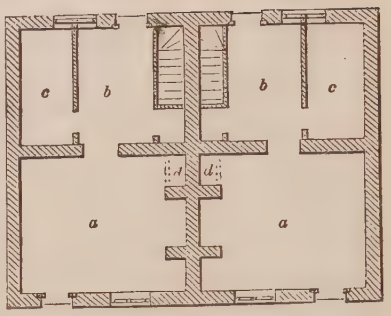


2266. *Estimate.* The actual cost of two such cottages, as stated by Mr. Emerson, the Earl of Leicester's builder, is from £110 to £115 each; which a proprietor, we think, might let for £4 a year, though Mr. Emerson thinks £6 ought to be the minimum rent for such a cottage. We agree that this would be a proper rent to one who had built them with a view to the employment of capital; but we think a landed proprietor, building on his own estate for his own workmen, ought to be content with 3 per cent, or what he would procure from the government funds.

2267. *Remarks.* These cottages, it is observed in the *Sanitary Report*, show what may be done "by a landed proprietor who takes as great a pride in his good cottages and farms as others in fine hunters and race-horses." It is remarkable that with so much lateral accommodation in the rooms of these cottages, they should only be from seven feet to seven feet six inches high; a height which, from the small quantity of air which it allows for breathing in, must be utterly unwholesome in the bed-rooms, and only tolerable in the rooms below in consequence of the frequent opening and shutting of the doors. The improvement that we would make to these cottages would be, raising the rooms to the height of nine feet, forming liquid-manure tanks to all the privies, adding porches, and surrounding them by their garden ground.

2268. *The Culford Cottages.* — These are double and sometimes treble cottages, built with bricks faced with blue flints, and with freestone facings to the doors and windows. At the distance of a few feet behind there is a wooden building roofed with tiles, which comprises a space for fuel, a privy for each cottage, and a common oven. Fig. 2059. shows a double cottage, in which *a* is the principal room,

2059



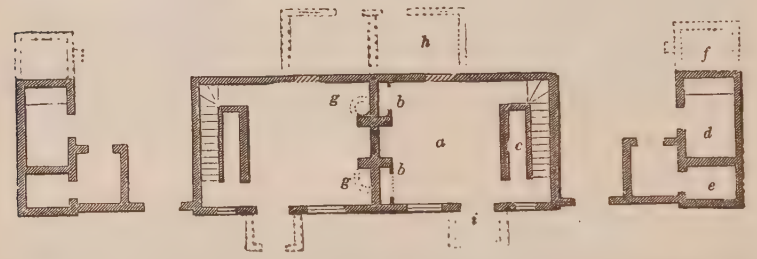
fourteen feet by twelve feet, and seven feet high, with a small closet, *d*; *b*, a back room, or scullery; *c*, a pantry; and there is a staircase, with a closet under, to two bed-rooms.

2269. *Estimate.* The average cost of these cottages, of which above fifty have been built within the last twenty years, by the Rev. E. Benyon, at Culford in Suffolk, is stated to have been about £170, or £85 each. Rent, £2 10*s.* to £3 3*s.*

2270. *Remarks.* The rooms have the same fault as those of the Holkham cottages, very few builders, until quite lately, being aware of the importance, with a view to health, of breathing in a large volume of air. There is an objection to the door opening at once into the principal room; which might be obviated by porches, which would at the same time take away from the dull uniformity of the exteriors.

2271. *The Harlaxton Cottages.* — These cottages, which have been erected by Gregory Gregory, Esq., at Harlaxton in Lincolnshire, are chiefly remarkable for their picturesque effect, and for the admirable management of the exterior appendages with a view to this result; but at the same time most of them have large rooms, eight feet or nine feet high, and all of them have large gardens. Fig. 2060. shows a plan of a

2060

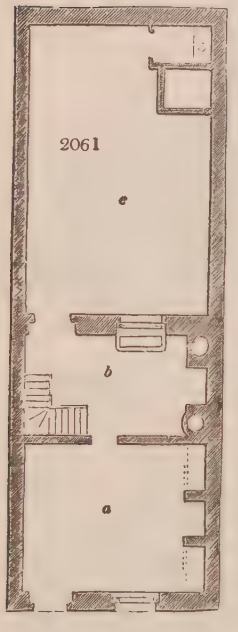


double cottage, in which *a* is the living-room, thirteen feet square, and eight feet high, independently of room for two closets at *b b*, and a large pantry at *c*. The stairs are roomy, and lead to two good bed-rooms, the one opening out of the other. To each cottage there is a building apart, forming a detached wing, containing a privy and hovel, *d*, and a hogsty, with yard, *e*. There is a front garden to each cottage, and a back garden of an eighth of an acre.

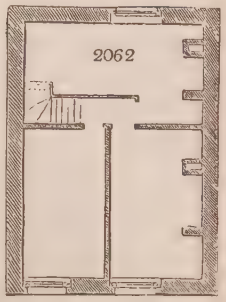
2272. *Estimate.* The actual cost of these two cottages is about £130, or £60 each; by which, allowing something for the garden, they might be let at £3 each.

2273. *Remarks.* A liquid-manure tank, with dung-pit or ash-pit over, might easily be added behind the privy, as at *f*; and an oven at one side of the kitchen fire, and a boiler at the other, as indicated by the dotted lines at *g g*, would be an improvement. A great defect is the want of a back-kitchen; but this might easily be obtained for each cottage by lean-tos, as indicated by the dotted lines *h*. No cottage, in our opinion, however humble, ought to be without some description of back-kitchen, for even though it had no fireplace, yet if it have a sink-stone and a window, it is well adapted for washing in, and for keeping tubs and other vessels that ought never to be in sight. A porch, as indicated by the letter *i*, would also be a great improvement. The combination of the privy and the hovel for fuel or pig's food is good. The elevation, like all the others in the village of Harlaxton, is eminently picturesque; the architectural taste of the proprietor being of the very highest order, as will hereafter appear in our section on villages.

2274. *The Turton Cottages* were built by Messrs. Ashworth of Turton, near Bolton in Lancashire, for the accommodation of workmen attached to their manufactories; and they are calculated for being placed in close contact, in rows. In fig. 2061. *a* is the living-room, five feet by thirteen feet; *b*, the kitchen, fifteen feet by nine feet, with an oven, grate, boiler, sink, and a closet under the staircase: above are three bed-rooms, with separate entrances from the landing, as shown in fig. 2062. There is a back-yard, *c*, twenty-five feet by thirteen feet, containing an ash-pit and a privy, with a door to a piece of garden ground or a back lane. If a garden is attached, then assuredly we



should recommend a liquid-manure tank under the place for ashes, as a certain means of doubling the produce of the garden.

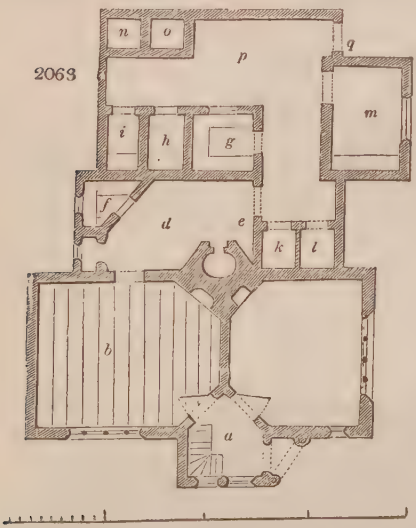


2275. *Street Cottages, or Labourers' Tenements in Towns.* — The plans of these supplied to the *Sanitary Report*, by the committee of physicians and surgeons of Birmingham, as being the best in use in that town, are considered by the authors of the *Sanitary Report* as the best they know of (see *Report*, p. 185.); but, as street houses do not come within our plan, we refer to the *Report* itself. We may observe that the Turton street houses are among the best of the kind that we know of in England. In Scotland, those at Deanston are of a very superior description, as are those at New Lanark, and at Crosslee near Paisley. Some at the latter place, built by Archibald Woodhouse, Esq., have two good rooms each, with a pantry and closets; a cellar for fuel and lumber; a wash-house, privy, and dung-pit, common to six families; and a garden to each. They are let so as to pay 3 per cent on the prime cost. In general, the owners of mills and manufactories in every part of the country build far better cottages for their workmen, than the owners or occupiers of land, and the comfort of families lodged in them is great in proportion.

Sect. III. *Miscellaneous Designs for Cottages, chiefly ornamental.*

Design I. — *A Cottage with ornamental Elevations in the Style of the ancient half-timbered Houses of England.* By T. J. Ricauti, Esq., Architect.

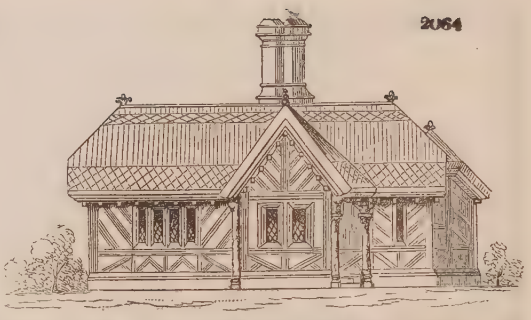
2276. *Accommodation.* In the ground plan, fig. 2063., *a* is a porch, which is for one modification of this design shown in fig. 2064., but which, for the elevations figs. 2067. and 2068., contains a stair; *b* is the kitchen shown rather larger, seventeen feet by fourteen feet, than the parlour, *c*, which is fourteen feet by thirteen feet; *d* is the back-kitchen, which contains an oven and sink at *e*, and a pantry, *f*; *g* is a dairy; *h*, a pigsty; *i*, a water-closet, which, however, would be better placed over or adjoining the liquid-manure tank, *n*, because where it is there will be a risk of its contaminating the air of the pantry; *k*, a place for poultry, most advantageously placed adjoining the sources of heat; *l*, a place for fuel; both these places are low lean-tos. The cow-house, ten feet by seven feet, is shown at *m*, and the liquid-manure tank and dung-pit at *n* and *o*; *p* is an open court, with a door at *q*.



2277. *The Elevations.* Fig. 2064. is a front elevation on the supposition that the cottage contains only one story. Fig. 2065. is a side elevation, showing the cow-house, the entrance to the court-yard, the porch, and the parlour window. Fig. 2066. is a perspective view combining both elevations. Fig. 2067. is a perspective view on the supposition that the cottage is raised higher, so as to contain two small rooms in the roof, and a small loft over the cow-house. Fig. 2068. shows the walls of the cottage carried up higher so

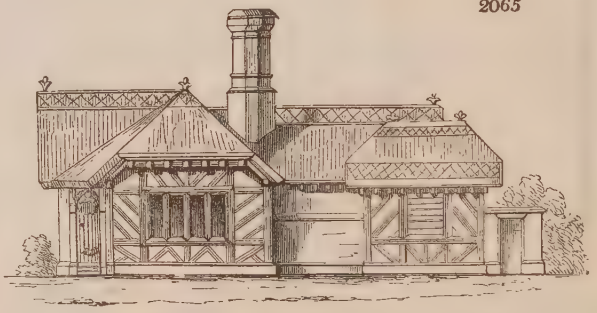
as to contain two good bed-rooms, and, if it were thought necessary, a third bed-room over the back-kitchen, dairy, &c. It will be observed, that in this elevation the porch is roofed in a different manner from what it is in any of the others, and that the additional height given to the walls is contained between a horizontal framework, sufficiently high to admit of bringing the roof of the porch below the line of the general roof. This, it will be seen, greatly improves the picturesque effect of the group.

2064

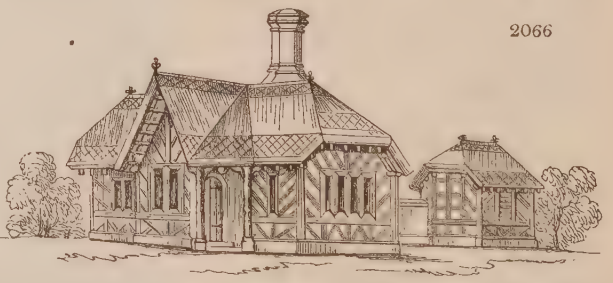


2278. *The Construction and Materials.* The foundations are of concrete, or of whatever other suitable material the locality affords, and they are carried up eighteen inches above the general surface of the surrounding ground. The floor within is raised one foot or two steps above the general surface, so that it is six inches lower than the top of the plinth formed by the foundation. On this plinth the framework is placed, which consists of a sill, into which are framed upright stancheons, forming the angles and the sides of the doors and windows, nine inches square; and they are framed into horizontal pieces of the same dimensions, the interstices being filled in with diagonal pieces, as shown in the elevations and views. The roof is proposed to be covered with thatch or reeds, in either case steeped in lime-water, and the chimney shafts to be of brick, to be splashed coarsely so as to imitate weather-stained bricks or stones. The following details are taken from the descriptive specification of Design I. of Ricauti's *Rustic Architecture*: — "In framing the roof, British fir may be used for the ridge piece, nine inches by two inches, and the

2065



2066

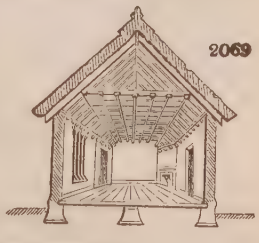


2067

2068

wall-plates, six inches by four inches, which are continued through the walls, as shown in the elevations. The ceiling joists are to be of rough wood, four inches by three inches, also continued through the walls, as shown in side elevation, fig. 2065. The collars of rough wood, five inches by three inches, notched down on the joists, and the openings boarded, or lath and plastered, so as to form ceilings. Forest timber, or the loppings of trees, may be chopped into shape, about six inches by three inches, for the rafters; these are crossed with light stuff, and covered with thatch. The inside of the walls may be battened and lath and plastered, and coloured with the following preparation, which, when properly mixed, will cover twenty-six square yards:—Quicklime, six ounces, rubbed down with a muller, to free it from all roughness; linseed oil, six ounces; Burgundy pitch, two ounces; skimmed milk, two quarts. The pitch to be melted with the oil over a gentle fire, and gradually incorporated with the mixture. Any kind of colouring ingredient may be added, to bring it to the tint required. The doors to be hung with T hinges, twelve inches long, ornamented with rough wood; a Norfolk latch and a 3*s.* lock to be attached to each door. The ceiling joists, collars, wall-plates, &c., in the interior, should not be concealed; for it may be observed in the perspective sketch, fig. 2069., that they may be rendered highly ornamental, both as a canted cornice and as a ribbed ceiling. This will be quite in character with the exterior parts of the building, with no additional expense, but only the exercise of a little taste in applying the material."

2069



Where such a cottage is to be considered principally as an ornamental structure in a pleasure-ground, for example, as a place of repose, or to drink tea in occasionally, Mr. Ricauti would recommend the finishing and furniture to be entirely in the rustic manner, the bark being removed, and the wood, as well as the floor, when the latter is of wood, stained with a decoction of walnut husks, to give it a subdued tone.

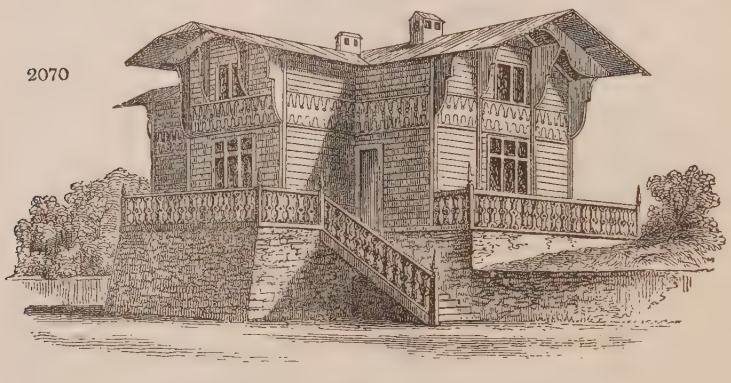
2279. *Remarks.* Half-timbered cottages are very picturesque objects, and seem particularly appropriate to a woody country; nevertheless, we cannot recommend them for general adoption, even if the expense were not an object, on account of the thinness of the walls, and the care requisite to keep the roof and other parts of the exterior in nice order. As ornamental objects in parks they are very desirable, both on account of their beauty and their historical interest; carrying back, as they do, the mind to the time when not only all the better kind of cottages in the central districts of England were built in this manner, but, as Holinshed informs us, most of the houses of the landed proprietors. A cottage built in the half-timbered style, in those parts of England where stone is the building material, or in Scotland where this is also the case, is not appropriate to the scenery of the country; but it has a strikingly ornamental effect in another point of view, that is, from its rarity and its contrast with the local cottages. No architect, that we are acquainted with, has paid so much attention to timber construction as Mr. Ricauti, of which this design and those in his published works bear ample evidence. In some parts of England half-timbered houses have the roofs covered with tiles, but this material is never so suitable as thatch or reeds; or, what is still better in point of economy and durability, as well as in appropriateness, the chips made by woodmen in working up coppice wood into wattle-work, hurdles, &c.

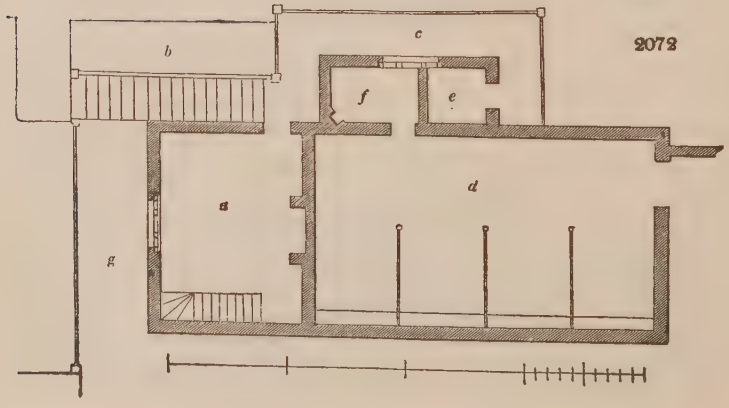
2280. *General Estimate.* Cubic contents of figs. 2063. and 2064. are 10,336 feet, at 6*d.* per foot, £258 8*s.*; at 4*d.*, £172 5*s.* 4*d.*; and at 3*d.*, £129 4*s.*

Design II.—*A Gate-Lodge, combining a Stable, in the Swiss Style.* By R. Varden, Esq., Architect.

2281. *Description.* The elevation is shown in fig. 2070. The situation of the cottage relatively to the house, stables, and other buildings, is shown in fig. 2071., in which *a* is

2070



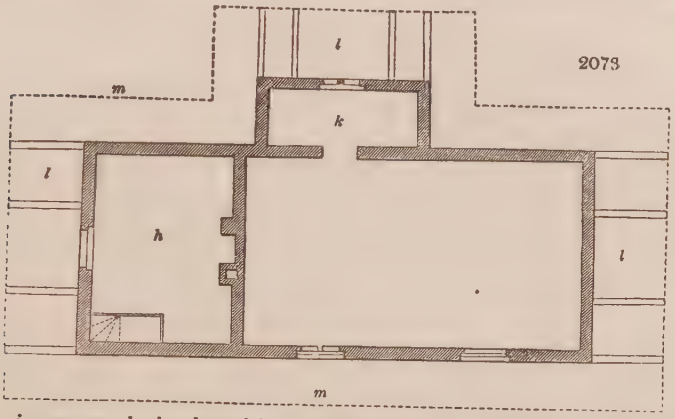


the lodge; *b*, the house; *c*, the stable-yard; *d*, the coach-houses; *e*, the stable end of the lodge; and *f*, cottages, which are screened by the lodge in the view from the house.

The ground plan of the lodge, fig. 2072., shows the cottage, with stairs to bed-room, *a*; outside stair, *b*; upper gallery, *c*; four-stall stable, *d*; seed-room, *e*; harness-room, *f*; and lower-gallery, with balustrade, *g*.

The chamber-floor plan, fig. 2073., shows the cottage bed-chamber, *h*; loft over the

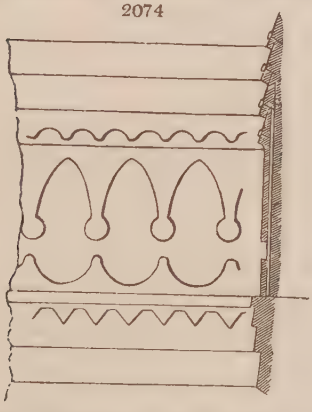
2073



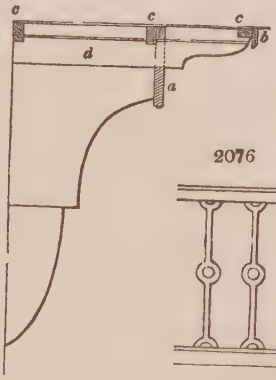
stable, *i*; granary, *k*; brackets, *l*, *l*, *l*; and dotted lines, showing the distance which the roof projects from the walls, *m*.

Fig. 2077. is an elevation of the cottage end of the lodge; fig. 2078. is an end view of the stack of chimneys; fig. 2074. is a part of the ornamental weather-boarding on a large scale; fig. 2075. is an enlarged view of one of the brackets for the gables, in which *a* is a section of the inner barge-board; *b*, a section of the outer barge-board; *c c*, rafters, and *d*, the purlin; fig. 2076. is an enlarged view of part of the balustrade.

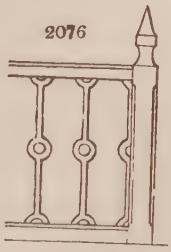
2074



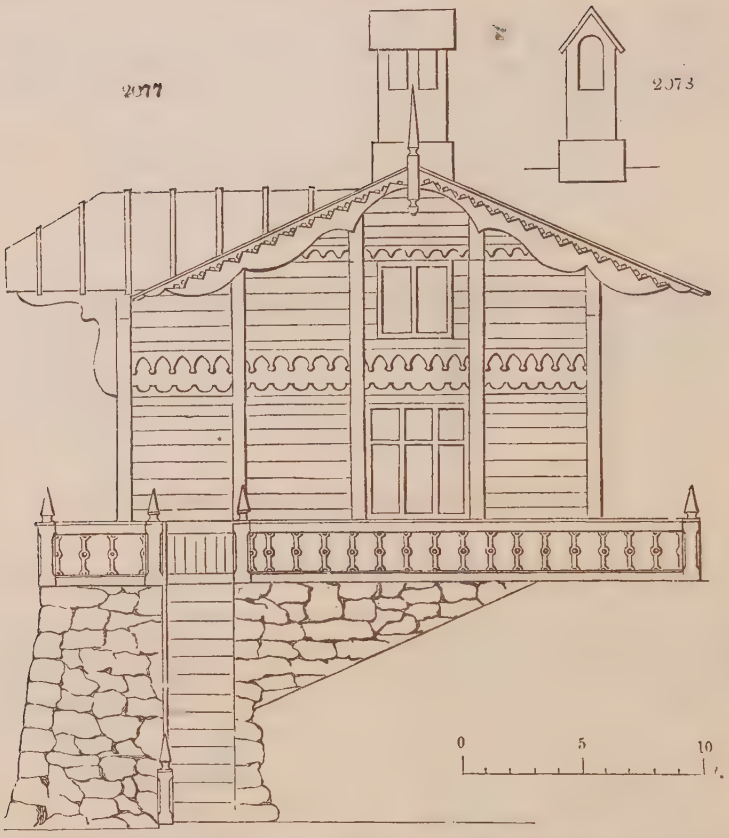
2075



2076



2282. *Description.* This building is just erected at Powick in Gloucestershire, for J. B. Morgan, Esq. It was designed under peculiar circumstances. A new approach road having been formed in a cutting ten or twelve feet deep, almost in front of the dwelling-house, and a screen being required on the farther side of this cutting, to exclude the view of several unsightly cottages, *f*, in fig. 2071., from the dining-room and drawingroom windows, it was decided to place there the stables and a small lodge residence, which were to form one building, and be of a somewhat ornamental character. The site being on the abrupt edge of the cutting, a bold and picturesque style of building was required, and the Swiss style was ultimately adopted. The walls under the balustrades are made two feet six inches thick, to support the earth bank on which the building is placed: they are built of unsquared granite, with garreted joints made very rough to enhance the picturesque appearance, and suit the character of the architecture. The walls of the building are formed of nine-inch brickwork, covered with deal weather-



boarding. The boards for this purpose must be chosen free from knots, and are best if cut out of Quebec red pine balk (log or squared trunk) or Riga balk. About one balk out of five of the former, or one out of a hundred of the latter, will be found clean enough for the purpose; and as several must be opened to select from, the same description of wood should be used for the timber framings, that the knotty balks may be converted without loss to the builder; and both these woods are suitable for the purpose.

Wood bricks, two feet three inches apart, should be inserted in every seventh course of the brickwork; and to them upright fir battens, three inches by one inch, should be fixed, and the weather-boards nailed on. The weather-boards should be neatly wrought, seven inches wide, seven eighths of an inch thick on one edge, and five eighths of an inch on the other, nailed on the lower or thick edge only, which will be sufficient to keep them firmly in their places, and allow them sufficient play to expand and contract without splitting.

The brackets are formed of oak, three inches by four inches, fixed with screw-pins to the wall and plate, and are covered with $\frac{1}{2}$-inch boards. The edges of the framework are wrought, and a $\frac{1}{2}$-inch round fillet put on the centre.

The barge-boards are three inches thick, cut out of solid boards.

The roof is covered with patent slating, which is of more suitable character than the common kind, and may be laid much flatter.

2283. *Patent Slating.* "In covering a roof with patent slates, which were first brought into use by Mr. Wyatt, the common rafters must be left loose upon their purlins, as they require to be so arranged that a rafter may lie under all the meeting joists; hence neither boarding nor battens will be needed; and, since the number of rafters depends on the width of the slates, when they are large, very few are necessary. This kind of slating may be laid on a much less elevated rafter than any other, as, the laps being much less than in common slating, it is considerably lighter. It is likewise com-

menced at the eaves, but is neither crossed nor bonded, the slates lying uniformly, with each end reaching to the middle of the rafter, and butted up to each other through the length of the roof. The eave slates are screwed down to the rafters by two or three strong 1¼-inch screws, at each of their ends. The joints are secured by filleting, or covering them with fillets of slates, about three inches wide, bedded in putty, and screwed down through the whole into the rafters. Slating is sometimes laid in a lozenge form, but it is much less durable than the common method." (*Stuart's Dict. of Arch.*)

2284. *Roofs covered with this Description of Slating* do not require lead hips and ridges, for the slates, when properly fastened and puttied, are sufficient to exclude rain and moisture. The projection of the eaves and gables being very great, it was feared strong winds might raise and damage the roof, therefore a course of bond timber was built into the walls, four feet from the top, to which the plate of the roof was attached by long screw-pins. By this arrangement the weight of brickwork keeps the roof steady.

Buildings of this character might be formed of timber framing, or of any common material, such as rough stone, concrete, chalk and straw, the consolidated earth or *pisé* walling, that would be cheapest in the particular locality. For the sake of additional durability, I have sometimes had Roman cement substituted for the weather-boarding, but worked into the same kind of pattern, and, when properly executed, it can scarcely be distinguished from wood; but, it must be acknowledged, the effect is rather inferior. The boards may be painted or not, according to the taste of the owner. The building at Powick is grained and varnished to imitate deep-coloured fir-wood; but a less expensive method I adopted at Cheltenham, by merely giving the boards two or three coats of boiled oil, slightly tinted with burnt umber, which preserves the wood as well as paint, and produces a lighter and more transparent effect, from the natural grain of the wood remaining visible. If the boards are knotty, the painting is to be preferred.

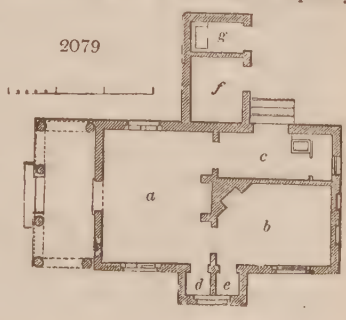
2285. *Remarks.* It is quite unnecessary for me to offer any remarks on the strong and picturesque character of the Swiss style of architecture, or of its applicability to entrance lodges, park buildings, and small dwellings for gamekeepers, &c. I regret it is not more frequently adopted, for it offers a pleasing variety from the Tudor and the Italian styles, now so generally, indeed almost universally, adopted for such buildings: it is no more expensive than other descriptions of ornamental building. With the exception of those I have erected, I do not remember having seen above three or four true Swiss buildings in the kingdom, though my travels, as you are aware, have not been confined to a few counties; no doubt there are many others, but they have not come under my observation. A suitable situation is of great importance to a Swiss cottage, but such may generally be found in an undulating, and always in a hilly, country. The edge of a steep bank, whether natural or artificial, is very appropriate. The slopes of railway cuttings and embankments are features that point out this style as suitable for small station-houses, if quite in the country; but there the character of the masses and the detail must receive more attention than railway engineers (who generally reject the architect's aid) are in the habit of devoting to their miscalled Gothic structures, which have become the laughing-stocks of every person conversant with the true principles of Gothic architecture.—*R. V. February* 3. 1842.

Design III.—*A Gate-Lodge and Gates.* By F. H.

The elevation of the lodge is shown in fig. 2080., and of the gates in fig. 2081.

2286. *The Accommodation* is shown in the ground plan, fig. 2079., and consists of a living-room, *a*; sleeping-room, *b*; back-kitchen, *c*; two closets, *d*, *e*; place for fuel and lumber, *f*; and privy, *g*.

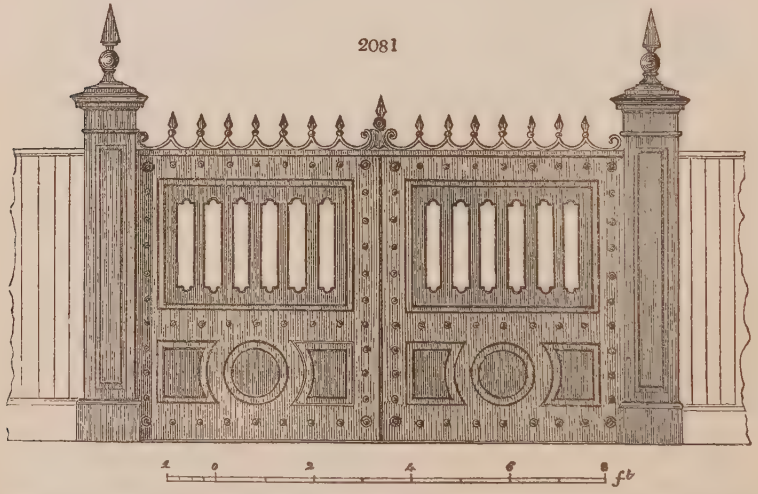
2287. *Remarks.* The exterior captivates at the first glance by its air of simplicity and elegance, produced by the general forms and lines, the arches rising from the columns, the arched windows, and the projecting eaves and chimney shafts, which are taller and much more elegant in the original than in our figure. So far the general design is good; but the artist has failed in his manner of construction; in a word, the materials he has used are not homogeneous. The walls are of plain brickwork, with stone dressings (or which, with respect to effect, is the same thing, and quite unobjectionable, dressings of cement in imitation of stone), and a freestone pronaos or porch, consisting of an arcade of three arches, of a very solid character, without archi-



2080

volt (an archivolt is the architrave of an arch) mouldings. Under this heavy mass of finished masonry, represented in coloured cement, three columns with the bark on, which may be taken for shores or props, are placed, provisionally, as it would appear, till the stone columns are prepared to take their place. To see a mass of stone or brickwork supported by props of wood, even though the latter should be hewn, is unsatisfactory even in the wall of a common shed or cottage; but to see green wood with the bark on used in a regular architectural design, is contrary to all ideas of fitness and propriety. The stone or compo arches over the green wood columns are without

2081



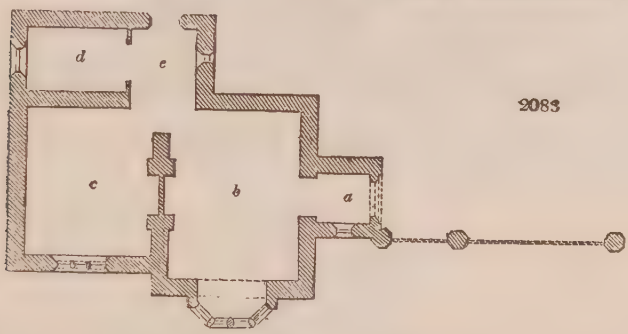
dressings though with keystones; whereas, to be consistent with the windows, they ought, like them, to have had archivolts as well as keystones. We think these objections unanswerable, and yet perhaps it is hardly fair to make them, for the artist, in all probability, intends, or intended originally, to clothe the wooden columns with cement, and to put cement architraves over the arches. This may yet be done, and then the building, as far as seen in the elevation before us, would, in our opinion, be unobjectionable. The gate is handsome; the piers and their terminations are designed in a style adapted for being executed in wood, and not in stone, as are the forms which we sometimes see given to wooden piers. We have not stated the name of the architect of this lodge, nor the place where it is erected, lest by any means we should give offence; more especially as we requested the permission of both parties, whom we highly respect, to publish the design.

Design IV.—*A Gate-Lodge at Ravensworth Castle.* By the Hon. Thomas Liddell.

The elevation is shown in figs. 2082. and 2084., and the ground plan in fig. 2083.

2288. *The Accommodation* shown in the latter is a porch *a*; living-room, *b*; bedroom, *c*; pantry, *d*; and back lobby, *e*. The other conveniences are in a detached building.

2082



2083

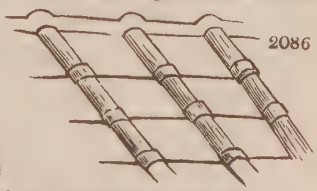
The walls are of stone, and two feet thick; and the pitch of the roof is high, in order to throw off the wet quickly, and it is covered with tiles, which are perfectly weather-tight, and proof against any force of wind. The form of the tile is shown in fig. 2085., and the appearance of a portion of roof covered by them in fig. 2086. It will be seen by fig. 2085., which shows only one tile, that the semi-cylindrical part and the flat part of each tile are moulded and cast together. The material of which the tiles are formed is the Mulgrave cement, mixed with coarse grit, in the proportion of equal parts of each. The composition, after being put in the mould, sets in a quarter of an hour. Each tile is eighteen inches square, and it laps over the adjoining tile about three inches, which renders the roof very little heavier than one of ordinary slate, and perfectly water-tight.

2084

2289. *Remarks.* We were struck with the handsome and substantial appearance of this lodge, when in the neighbourhood of Durham in the autumn of 1841; and having heard that it was designed by the Honourable Thomas Liddell, we applied to him, and he kindly sent us the sketches from which the engravings have been made. Mr. Liddell is an amateur architect, whose architectural knowledge and taste are such, as to enable him to design and superintend the execution of the additions which have been making for several years past to Ravensworth Castle, the seat of his noble father. The elevations of the gate-lodge are far from doing justice to the originals, from the roofs not showing the peculiar character given by this description of tile.

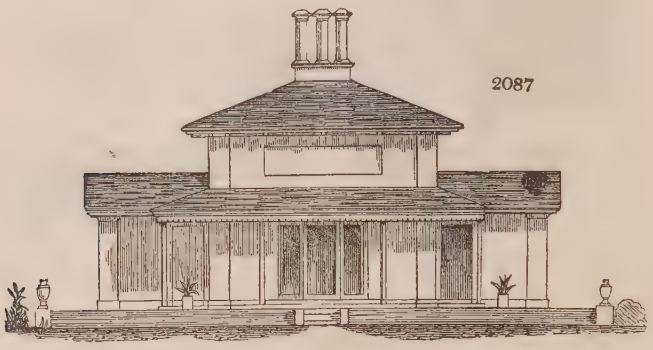
2085

2086



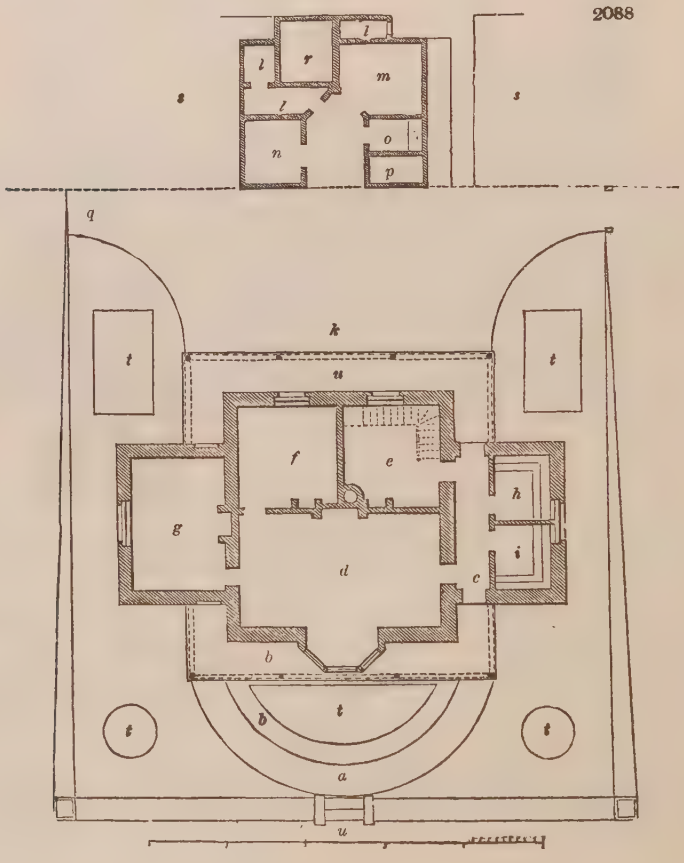
Design V.—*A Cottage in the Style of the Wingfield Station-House, on the North Midland Railway.* By Francis Thompson, Esq., Architect to the North Midland Railway Company.

2087



The elevation, on the supposition that there is a bed-room floor, will be as in fig. 2087 ; or should there be no bed-room floor, as in fig. 2089.

2088



2089

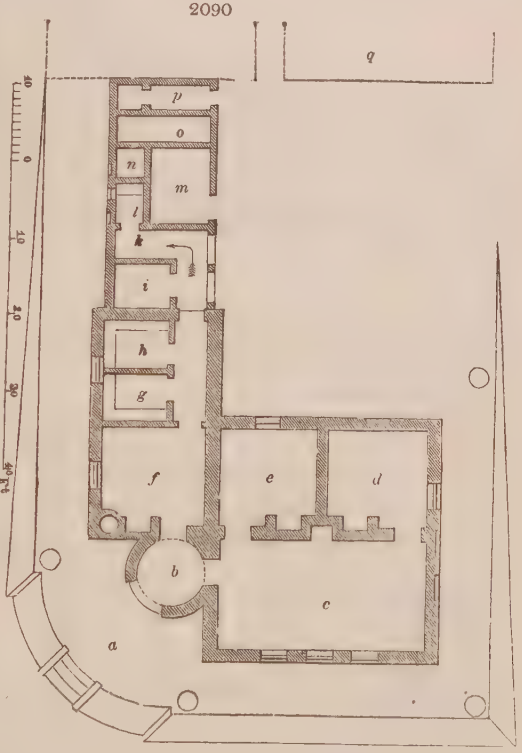
2290. *The Accommodation* is shown in the ground plan, fig. 2088., in which *a* represents a terrace; *b*, a veranda; *c*, the entrance-door; *d*, living-room; *e*, scullery; *f*, bed-room; *g*, bed-room; *h*, dairy; *i*, pantry; *k*, yard; *l*, piggery; *m*, cow-house; *n*, coals; *o*, privy; *p*, liquid-manure tank; *q*, dust; *r*, dairy; *s s*, garden; *t t t*, flower-beds; *u*, terrace steps.

2291. *Remarks.* This may form a very comfortable cottage, as well as a handsome one, as the living and sleeping rooms are large and convenient. The two parallelogram flower-beds are not of forms that harmonise very well with the situation, but that is not the fault of Mr. Thompson, as the alterations were made by our draughtsman.

Design VI. — *A Cottage in the Style of the Eckington Railway Station.* By Francis Thompson, Esq., Architect.

The elevation is shown in fig. 2091.

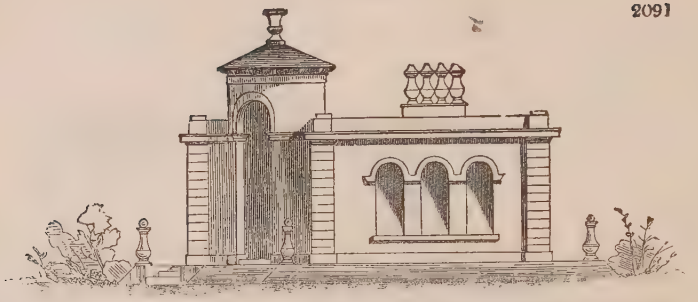
2090



2292. *The Accommodation* is shown in fig. 2090., in which *a* is a terrace; *b*, a porch; *c*, a living-room; *d* and *e*, bed-rooms; *f*, scullery; *g*, pantry; *h*, dairy; *i*, coals, &c.; *k*, passage leading to the privy; *l*, privy; *m*, cow-house; *n*, liquid manure; *o*, dung; *p*, pigs.

2293. *Remarks.* The plan and elevation are both original and handsome, and the arrangement of the offices admirable. This design and the others contributed by Mr. Thompson are very different in character from ornamented cottages generally. They appear to us admirably adapted for the dwellings of persons connected with public or national works, such as railroads, canals, public parks, promenades, gardens, &c.; and they would also be very suitable for country public-houses along main roads. With an additional room or two, any one of them might be rendered fit for the occupation of a gentleman with a small family. We cannot sufficiently express our admiration of the public spirit of the directors of the North Midland Railway, in causing the erection of such architectural gems along their line of works. They are great ornaments of themselves, and as they will be seen by many thousands of all ranks, and remain, it is to be hoped, for several generations standard models of cultivated design, they can hardly fail greatly to improve the general taste of the country. Even the mechanics who have worked at their construction

2091

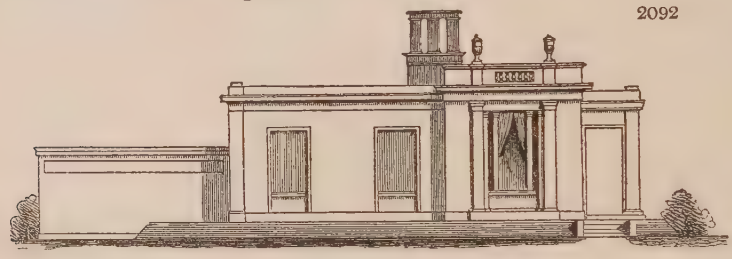


must have had their ideas enlarged, and their taste more or less refined by them. We wish we could see the same spirit actuating the directors of all railroads, the result of which would be, provided some attention were paid to the verdant scenery on the banks, the most interesting public ways in the world.

Design VII.—*A Cottage in the modern Italian Style.* By Francis Thompson, Esq., Architect.

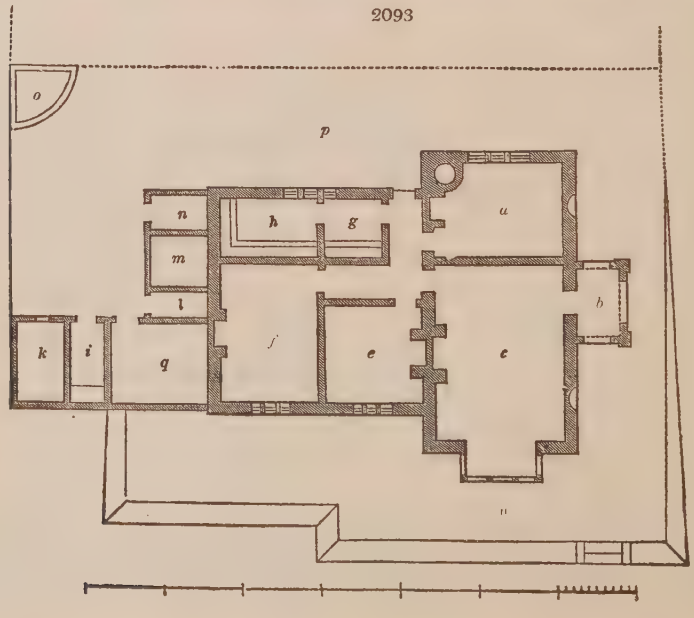
The elevation is shown in fig. 2092.

2092



2294. *The Accommodation* is shown in fig. 2093., in which *a* is a terrace; *b*, porch;

2093



c, living-room; *d*, scullery; *e* and *f*, bed-rooms; *g*, pantry; *h*, cellar; *i*, cow; *k*, pig; *l*, privy; *m*, liquid manure; *n*, coals; *o*, dung; *p*, yard; and *q*, dairy.

2295. *Remarks.* The ground plan is extensive, and the elevation elegant.

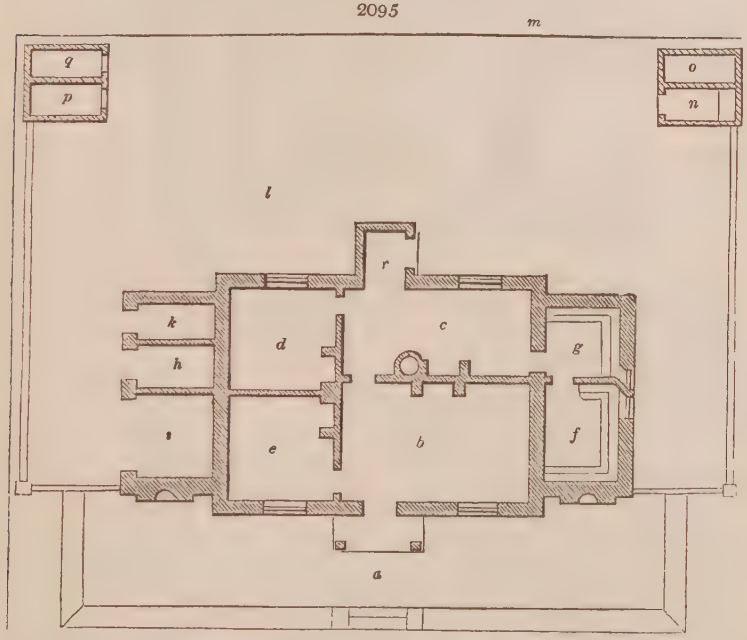
Design VIII.—*A Cottage in the Style of the Belper Railway Station.* By Francis Thompson, Esq.

The elevation is shown in fig. 2094.

2094

2296. *Accommodation.* Fig. 2095., which is to a scale of twenty-five feet to an inch, shows *a*, terrace; *b*, living-room; *c*, scullery; *d* and *e*, bed-rooms; *f*, dairy; *g*, pantry; *h*, piggery; *i*, cow-house; *k*, coals; *l*, yard; *m*, garden; *n*, privy; *o*, liquid manure; *p*, dust; *q*, dung; *r*, back entrance.

2095



2297. *Remarks.* The plan is commodious, and the elevation simple and grand. To render this residence fit for a gentleman, we have only to turn *b* and *c* into living-rooms; *f* and *g* into bed-rooms; *d* into a kitchen; *h* and *k* into a pantry and dairy, or a servant's bed-room and pantry; *i* into a bed-room; and *e* into a general dressing-room and cloak and boot room; a very convenient room in the country, where the master and his friends are much out of doors, and where visitors are received without much ceremony. The cow-house, *i*, may be placed in the yard, adjoining *p*, and if a cow is not kept it may be used as a stable, and a gig-house may be built adjoining it. The place for coals, *k*, may be transferred to the space between the porch, *r*, and the window to *d*. The piggery may be placed in the yard, beside *n*. We have now a very comfort-

able small house, with a yard in which any additional offices may be erected that are thought necessary. If the yard is enclosed by walls there should be a broad border for flowers and ornamental climbers; and, if it is enclosed by a hedge, there ought to be ornamental standard trees in it, and flowers and roses in the border. If any plants are trained against the house they ought to be confined to the plain spaces between the quoins and the architraves, so as not to interfere with architectural forms and lines; indeed, as a general rule, all edifices that show much of architectural design should be left free from plants. If a few are introduced in any plain part, that part should first be covered with a wooden trellis painted of a stone colour, on which to train the plants. The subject of training plants, and especially vines and fruit trees, on cottage walls and roofs, will be found treated of at length in our *Suburban Horticulturist.*

Design IX.—*A Cottage in the Style of the Ambergate Railway Station.* By Francis Thompson, Esq., Architect.

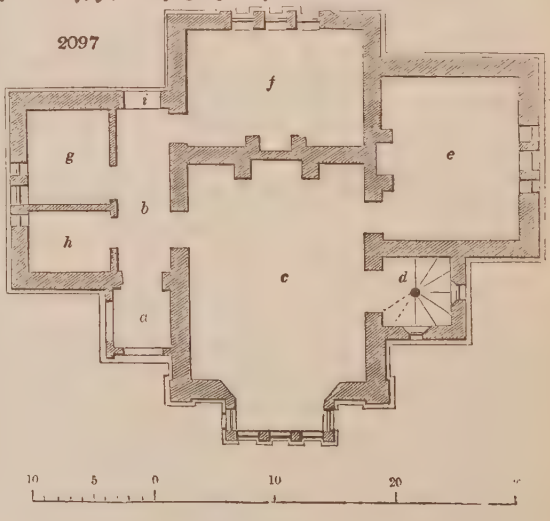
The elevation is shown in fig. 2096.

2096

2298. *Accommodation.* Fig. 2097. shows a porch, *a*; passage, *b*; living-room, *c* staircase, *d*; bed-room, *e*; scullery, *f*; dairy, *g*; pantry, *h*; back-entrance, *i*.

2299. *Remarks.* This design is chiefly remarkable for the elevation, which is surpassingly handsome. Those who wish to see beautiful engravings of the railway stations which form the types for these five designs should have recourse to Mr. Thompson's splendid work entitled *Railway Stations*, folio, 1842, 25*s*. This work also contains engravings of three other beautiful station houses, on the same line of railroad, besides the splendid terminus at Derby, which is upwards of one thousand feet in length, and replete with every convenience required in such a structure.

2097



Design X.—*The Edensor Gate-Lodges and Gates at Chatsworth.* By the late Sir Jeffry Wyatville, Architect. The Description by John Robertson, Esq., Architect, Chatsworth.

The elevation of one of the lodges is shown in fig. 2098., and of both, together with the gates, in fig. 2099. The ground plans are shown in figs. 2100. and 2101.

2098

2300. *Description.* Fig. 2100. is the plan of an old English lodge, built of bricks and timber, as shown in fig. 2098. In this plan, *a* is a covered way or open porch; *b*, porch; *c*, lobby or inner porch; *d*, parlour; *e*, stairs; *f*, pantry; *g*, another pantry; *h*, a recess from the living-room, *i*; *k*, kitchen; *l*, privies; *m*, shed round the piggeries; *n*, yard; *o*, gate to yard. Two families live in this house, which accounts for the two pantries, and the parlour *d* is converted into a living-room.

2099

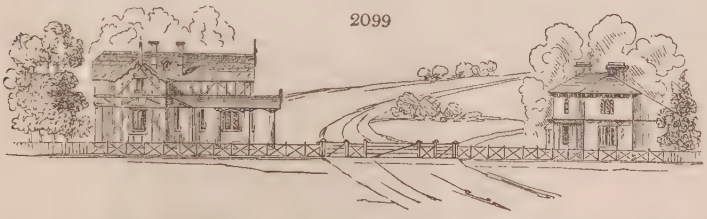


Fig. 2101. is an Italian lodge, shown in the right side of fig. 2099., built of stone: *a* is the entrance-porch, open; *b*, porch; *c*, lobby and staircase; *d*, living-room; *e*, parlour; *f*, kitchen; *g*, pantry; *h*, lobby and back-door; *i*, covered way to privy, *k*; *l*, shed including pigsties; *m*, yard; *n*, gate to yard; *p*, road leading to Pilsley and Bakewell; *q*, road to Edensor Inn; *r*, gate; *s*, road to Edensor and Chatsworth. Both houses have chambers over the lower rooms.

2100

2101

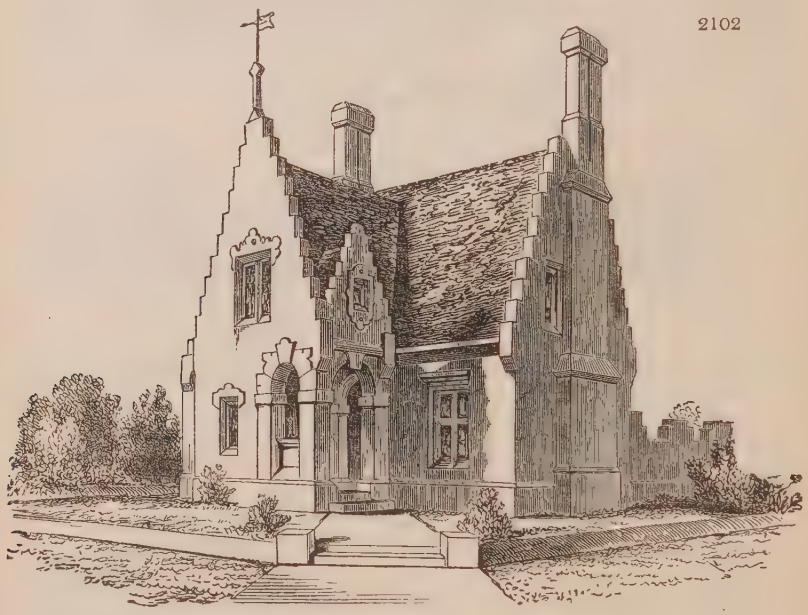
2301. *Remarks.* These lodges were both built from designs by the late Sir J. Wyatville: they were finished in October, 1839. They have no merit in an architectural

point of view; but the one is historically interesting, as showing the kind of building which was formerly constructed of timber framing filled in with bricks, in no very scientific manner; and the other is a specimen of what, twenty years ago, was reckoned the Italian manner. Such, however, is the grandeur of the scenery where they are placed, and to which the road leads, that these lodges escape critical notice. "There are two handsome lodges at the Baslow entrance to the park, nearly completed. They are also from designs by the late Sir Jeffry. They are built of beautiful rubbed or polished stone in the modern Italian style. Two are likewise to be built at the Beely entrance. These lodges were the last productions of Sir Jeffry for Chatsworth. An entrance-lodge to the village of Edensor is now being built in the castellated style: it is one of mine. — *J. R. Chatsworth, March* 15. 1842."

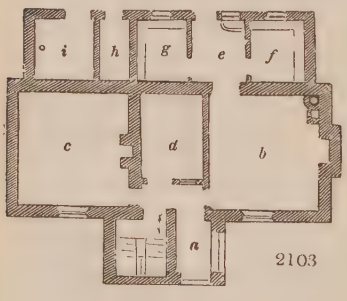
Designs XI. to XIV. — *Four Ornamental Cottages, with the same Accommodation as in the Model Cottage* No. I., p. 1141. By E. B. Lamb, Esq., F.I.B.A.

2302. Design XI., of which fig. 2102. is the elevation, and fig. 2103. the ground

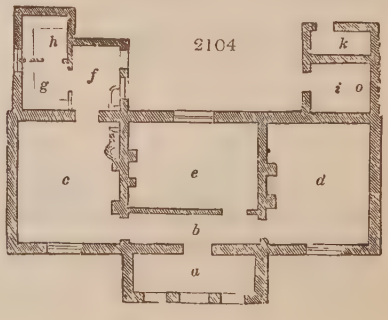
2102



plan, is in the Scotch style, and characterised by steep roofs, slated, and with the gable walls furnished with what are called crow steps. The ground plan contains a porch *a*, adjoining which is the staircase; a kitchen, *b*; best room, *c*; bed-room, *d*; back-kitchen, *e*; pantry, *f*; dairy, *g*; poultry-house or oven-house, *h*; and cow-house, *i*. The rest is supposed to be as in the agricultural model cottage. This design may be



2103



2104

considered as an example of the Scotch style, ennobled by the grandeur of the proportions, and by the projection of the chimney from the gable wall; a feature never seen in the unimproved Scotch cottage, but one, as we have elsewhere observed, essential to cultivated architectural expression.

2303. Design XII., of which fig. 2105. is the elevation, and fig. 2104. the plan, is in the Italian style. The accommodation is much the same as in the model cottage No. I.,

2105

but somewhat differently arranged. The plan shows a porch, *a*; passage, *b*; kitchen, *c*; two bed-rooms, *d*, *e*; back-kitchen, *f*; pantry, *g*; dairy, *h*; and cow-house and pigsty, *i*, *k*. The other appendages are as in the model cottage.

2304. Design XIII., the elevation of which is shown in fig. 2106., is adapted for a plan nearly the same as in the model cottage, but without a porch, or, rather, with the porch inside of the house. The walls in this design are shown of great thickness,

2106

which renders it suitable for being executed in rough stone, in compressed earth, or in cob; or, where workmen can be induced to take the trouble, in hollow walls of brick on edge, two feet in thickness, and filled in with concrete or with a mixture of clay and lime. Where a cottage is only one story high, we greatly prefer thick walls of earth, on a solid foundation of brick or stone, to walls nine inches or a foot in thickness, built of brick, or of any other material whatever, on account of their great warmth. Such walls may always be finished within, in as good a style as brick or stone walls; as a proof of which we have only to refer to the houses built of compressed earth at Woburn Abbey.

2305. Design XIV., of which fig. 2107. is the elevation, is a cottage of two stories, containing exactly the same accommodation as the model cottage No. I., but in a substantial massive style, and with the stack of chimneys carried up in a small tower.

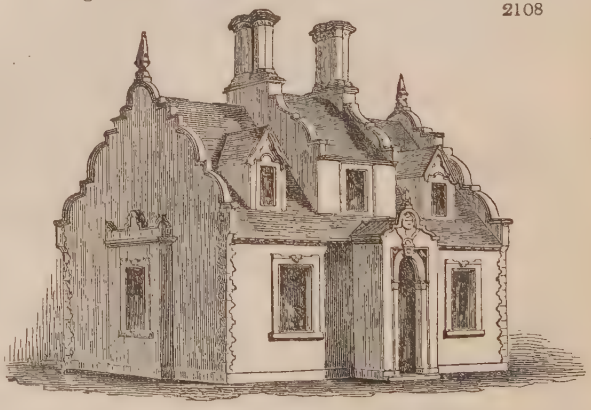
2107

2306. *Remarks.* These designs are given to show how the humblest dwelling may be ennobled, when it passes through the hands of an architect of genius like Mr. Lamb. It will be observed, that in all of them the ornament is bestowed on the essential parts of the construction, such as the porch, chimney tops, doors, windows, gables, &c., and not tacked on the naked parts of the walls, as frequently practised by architects and amateurs, who do not know the difference between covering an object with ornaments, and enriching it.

Design XV. — *A Cottage in the Style of Heriot's Hospital, Edinburgh.* By John Henderson, Esq., Architect.

The elevation is shown in fig. 2108.

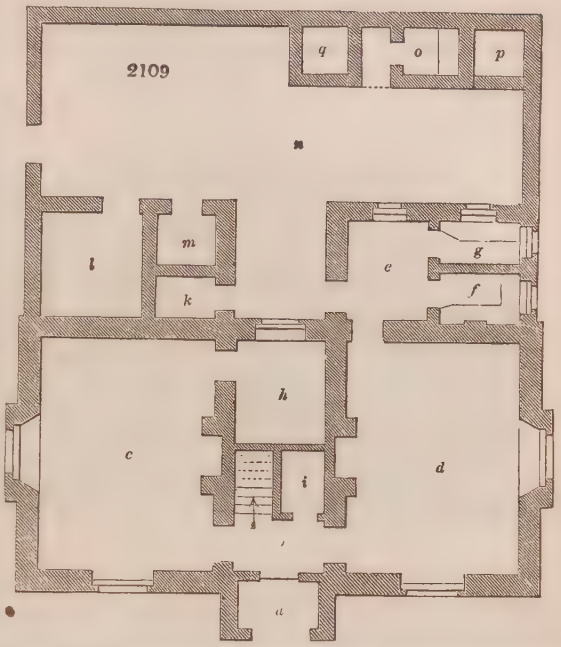
2108



2307. *Accommodation.* The plan, fig. 2109., shows a porch, *a*; a lobby, *b*; a living-room, *c*; a kitchen, *d*; back-kitchen, *e*; a pantry, *f*; dairy, *g*; a bed closet, *h*; store closet, *i*; fuel, *k*; cow-house, *l*; pig, *m*; yard, *n*; privy, *o*; liquid manure, *p*; dust and dung, *q*.

2308. *Remarks.* The inhabitants of Edinburgh are great admirers of this style of architecture, which no man understands better than Mr. Henderson; as his very beautiful design for a seed-shop, connected with an agricultural museum, erected, the former for Mr. Lawson, and the latter for the Highland Society of Scotland, on George IVth's Bridge, Edinburgh, sufficiently proves. No person of taste can have visited Edinburgh without having been struck by that splendid edifice, Heriot's Hospital, which is the central building of an institution for the gratuitous education of natives of Edinburgh. Fortunately the institution is rich, and the trustees have been enabled to erect branch schools in different

parts of the city, and these, with all the farm buildings and cottage dwellings on their extensive landed estates, when rebuilt, are erected in the style of the parent building. This, we think, evinces much propriety and good taste on the part of the trustees, and cannot fail, by the example which it exhibits, to have a favourable influence on the general progress of improvement in agricultural buildings, schools, and labourers' cottages. In Mr. Lawson's seed-shop, every part of the fixtures and fittings-up, and even the furniture, partakes of the style of the exterior; and, in short, it is, we believe, the most complete seed-shop in the world.



Heriot's Hospital was built in the beginning of the seventeenth century, and the architect is commonly said to be Inigo Jones, and the style that of James VI. or Elizabeth. Many competent judges, however, are of opinion that Inigo Jones was not the architect, the style of that artist partaking much more of the Roman and the Italian, as it existed in his time, than of what we now call Elizabethan. According to Hakewell, in his *Attempt to determine the exact Character of Elizabethan Architecture* (8vo, 1835), the Elizabethan style, or, as its earliest manifestations are called, the style of James VI., is a modification of the *cinque-cento* style of Italy. This style, he says, is wholly unmixed with Gothic forms or Gothic enrichments; it has not the ornamented gable, the bay, or the oriel window, of the domestic Gothic, for these were all in common use long before: but it consists of a number of forms more easily executed than those of either the Grecian or the Gothic styles; and we may add that these forms were chiefly such as could be delineated by the aid of the rule and compasses. A great many Elizabethan houses were erected by John Thorpe, and there is a MS. book of plans and elevations by this architect in the Soanean Library: the plans and elevations are neatly drawn, but, wherever the smallest attempt is made to introduce ornament, or the human figure, it is not above the execution of the most ordinary mechanic. Architects, in those days, were not, as they frequently now are, good artists. Hence, as we have just hinted, all the ornaments and ornamental finishings in the Elizabethan style consist of combinations of geometrical curves and circles with straight lines, angles, and cubes. The Elizabethan style, Mr. Hakewell continues, may be classed under two divisions; the first, or proper, being the *cinque-cento* style of Italy, as introduced at Longleat and part of Hatfield; and the second, or lower order, that in which, as far as possible, the same forms were observed, but the decoration and enrichment confined to such figures as the common mason or joiner could execute, as at Wollaton, Dorton, and many other mansions. It would thus appear that the Elizabethan style, like every other, arose out of a sort of necessity, viz., that of adapting the style of ornament to the means of getting it carried into execution. In the present day the revival of this style pleases by its novelty, and the skill of modern artists has carried it out to such an extent as greatly to increase its beauty, and its distinctive characteristics as a style.

Design XVI.—*The Dairy Lodge erected at Chequers Court, Buckinghamshire, for Sir Robert Frankland Russell, Bart.* By E. B. Lamb, Esq., F.I.B.A.

2309. *The Chequers Dairy Lodge*, of which fig. 2110. is an elevation, and fig. 2111. a plan, is placed near the entrance to the beautiful valley called the Velvet Lawn, at

the ancient seat of Chequers, in Buckinghamshire, for the protection of the property in this situation, and also as a dwelling for an upper servant. It is about a mile from the mansion, and a few yards from a beautiful and plentiful supply of water.

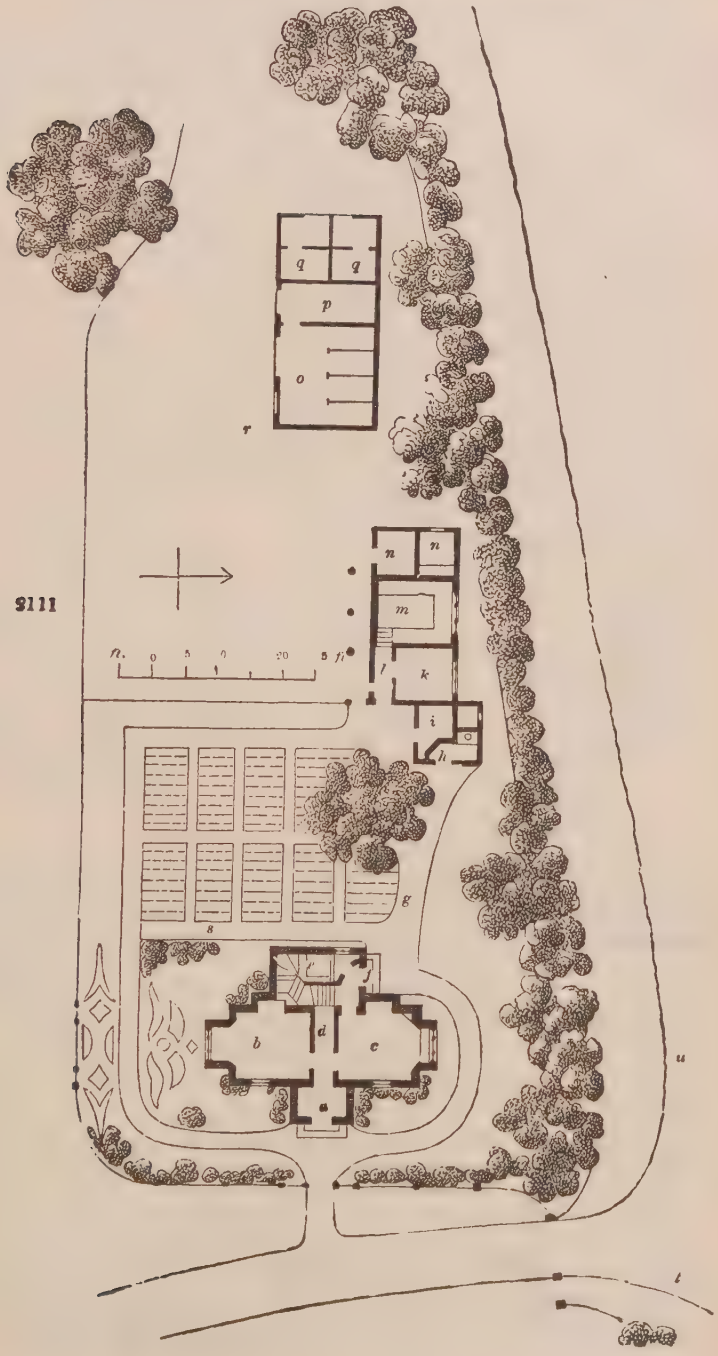
2110

2310. *The Lodge* contains on the ground floor a porch, *a*; sitting-room, *b*; kitchen, *c*; passage, *d*; pantry, *e*; and back entrance, *f*. On the one-pair floor are three bed-rooms. The lodge is surrounded by a garden, *s*; and from the back entrance, by the path *g*, there is a communication to the dairy. There is a privy, *h*, with a cesspool behind, open at top; *i* is a wood and coal house; *k*, a churning-room; *l*, passage and steps descending to the dairy; *m*, the dairy, the floor of which is three feet below the surface of the ground.

The walls of the ground floor of the cottage are built with brick and flints in chequered courses, flint being one of the common building materials of this part of the country. The sills of the windows, and the arches of the porch and back door, are of Bath stone. The walls of the upper floor are formed of timber framing, covered with ornamental tiles on the outside and plastered within. The verge-boards and pinnacles, also all the mullions of the windows, are of Memel timber, and painted to imitate oak. The tiling is coloured to harmonise with the other materials, and the roof is thatched. The whole of the woodwork is prepared by Kyan's process; and, indeed, all the woodwork for the buildings recently erected and now erecting on this property is prepared in this manner, a tank having been formed for that purpose.

2311. *The Dairy*, fig. 2111., *m*, is fitted up with stone shelves on three sides, and paved with tiles: the window is in the north side; and, when it is necessary to admit air, the casement only is opened, gauze wire being fixed to keep out the flies. On the south side, externally, every alternate rafter of the roof is continued down, so as to form a lean-to shed, in order to keep the sun off the wall as much as possible; and under this shed, close to the ceiling of the dairy, are openings for ventilation. The shed is also useful for placing pans, tubs, &c., to dry and season. It is covered with tiles, as in this situation thatch would be liable to be injured by the cows. The other part of the roof is thatched. The walls of the dairy are built hollow.

2312. *The Poultry-houses*, *n n*, with a dove-house over them, adjoin the dairy. The cow-house and pigsties form a group by themselves. The cow-house is erected with unbarked timber, and covered with thatch; *o* are the cow-stalls; *p*, calf-pen, which is made large enough to serve as an occasional stall for a horse; *q q*, pigsties and yards; and *r* the yard to the cow-house, poultry, &c. This building is erected entirely with unbarked timber, principally larch, and some beech. Young trees, from six inches to nine inches in diameter, are sawn down the middle, and placed in upright, horizontal, and diagonal forms, so as to produce an ornamental appearance. The whole of the timber was cut down near the spot, and cut to the proper lengths and Kyanised. The thatching is also Kyanised. This is a mere experiment. As the thatch absorbs a considerable quantity of the liquid, the expense is greater than that of Kyanising timber. The lodge is surrounded with a fence or wood in the same character as the building. The posts have ornamental caps. The fence of the yard is of unbarked larch.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Designs XVII. — XXV. *The Cottages in Cassiobury Park.*

2313. *The late Earl of Essex* took great delight in improving the cottages on his estate at Cassiobury, and many of them were built or improved from his own designs. The following views and plans were published by Mr. Britton, in his very elegant and interesting *History of Cassiobury Park*, published in 1837; and to that gentleman we are indebted for the use of the engravings. "In different parts of the park and grounds," Mr. Britton observes, "are various cottages and lodges, which are distinguished at once for their exterior picturesque features, and for the domestic comfort they afford to their humble occupants. Unlike the ragged wretched sheds and hovels which are too often seen by the road side, and even in connexion with some of the large and ancient parks of our island, the buildings here delineated are calculated to shelter, to console, and gratify the labourer after his daily toil, and to make his wife and family cleanly and diligent. The cottages at Cassiobury have been designed with the twofold object of being both useful and ornamental. They are occupied, exempt from rent and taxes, by men and women who are employed by the noble landlord in various offices about the park, the gardens, and the house; thus, the park-keeper, a game-keeper, a shepherd, a lodge-keeper, a gardener, a carpenter, a miller, a lock-keeper, &c., are accommodated."

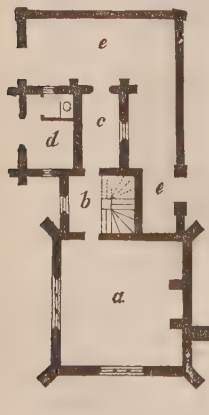
In the interior arrangement of these cottages, most of them contain a porch, a sitting-room, one or two bed-rooms, and a wash-house, with an oven and copper.

2314. Design XVII.—*Great Beech Tree Cottage.* Fig. 2112. is a plan of Great Beech Tree Cottage, which, being of larger extent than the others, and highly ornamented exteriorly, may be considered in the light of a cottage ornée. It has five rooms on the ground floor, and others up stairs. The ground plan contains, *a*, sitting-room; *b*, bed-room; *c*, porch and passage; *d*, sitting-room; *e*, housekeeper's room; *f*, pantry; *g*, cellar; *h*, back entrance; *i*, kitchen; *k*, porch.

2112

2113

2315. Design XVIII.—*Ridge Lane Cottage.* Fig. 2113. is Ridge Lane Cottage, which is of two stories, each appropriated to a family. In the elevation of this cottage (not given) there is a porch of entrance for the family who occupy the ground floor, and a porch at the top of an outside staircase, for the occupant of the upper floor. The ground plan contains, *a*, kitchen; *b*, sitting-room; *c*, bed-room; *d*, wash-house, oven, &c.; *e*, pantry; *f*, staircase to a floor for another family; *g*, porch.

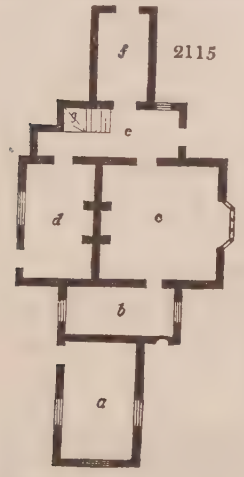


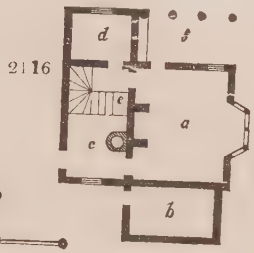
2316. Design XIX.—*London Entrance Lodge to Cassiobury.* Fig. 2114. is the entrance lodge for two families, in which *a* and *g* are sitting-rooms; *b*, staircase; *c*, entrance; *d*, wood-house; *e*, passage, with dwarf wall; *f*, gates; *h*, octagon staircase to bed-room; *i*, wash-house. This cottage forms the lodge to the London entrance, and is understood to have been partly the design of Wyatt, and partly of the earl. It certainly forms a very handsome group. The massive gates are hung with Collins's hinges, and move so easily that they may be opened or shut by a child.

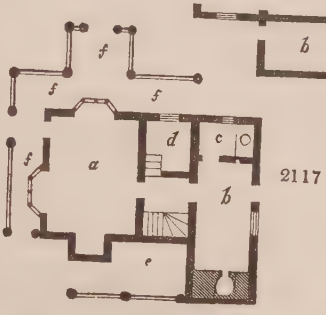
2114

2317. Design XX.—*The Park-Keeper's Cottage.* Fig. 2115. is a ground plan of the park-keeper's cottage, in which *a* is a slaughter-house; *b*, a dairy and larder; *c*, a sitting-room; *d*, kitchen; *e*, entrance; *f*, porch; and *g*, staircase.

2318. Design XXI.—*Thorn Cottage.* Fig. 2117. is a ground plan of Thorn Cottage, in which *a* is the sitting-room; *b*, bakehouse and scullery; *c*, privy; *d*, cellar; *e*, shed over well; *f*, porch and covered way.

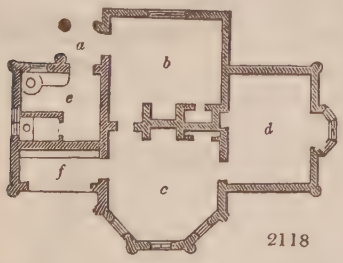


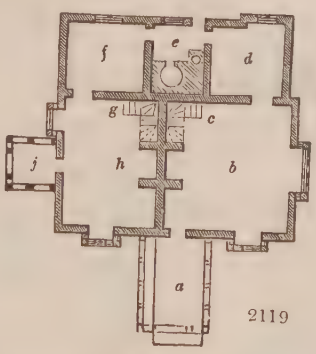




2319. Design XXII.—*The Shepherd's or Keeper's Lodge.* Fig. 2116. is the shepherd's or keeper's lodge, in which *a* is the sitting-room; *b*, wood-house; *c*, wash-house and oven; *d*, pantry; *e*, staircase; *f*, porch.

2320. Design XXIII.—*The Russell Farm Lodge.* Fig. 2118. is called Russell Farm Lodge, and is erected at the entrance to Russell Farm, by the side of the public road between Watford and Berkhampstead. Russell Farm is occupied by General Sir Charles Colville, Bart., who rents it from the Earl of Essex. The ground plan contains, *a*, back porch; *b*, kitchen; *c*, sitting-room; *d*, bed-room; *e*, wash-house, &c.; *f*, front porch, with seat.



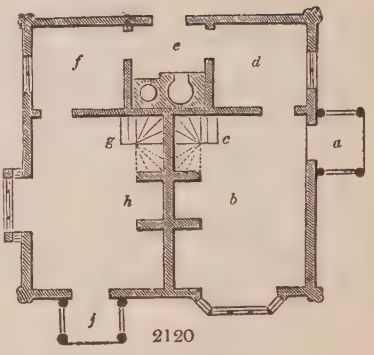


2321. Design XXIV.—*Russell Cottage.* Fig. 2119. is Russell Cottage, for two labourers' families. The ground plan contains, for the one cottage, a porch, *a*; sitting-room, *b*; staircase, *c*; wash-house, *d*; and oven and copper common to both cottages, *e*. The other cottage contains a wash-house, communicating with a room containing the common oven and boiler; a living-room, *h*; stairs to the bed-room, *g*; and porch, *j*.

2322. Design XXV. — *Cassio-bridge Cottage.* Fig. 2120. is Cassio-bridge Cottage, for two labourers' families. The walls of this cottage are covered with split hazel, and other rods, the flat side being applied to the walls, and the bark exhibited externally to the weather and the eye. The pieces are all of the same diameter, but of different lengths, and they are arranged so as to throw the surface into panels, variously composed, in the manner of the Duke of Marlborough's garden structures at White Knights.

The ground plan of each of these cottages shows exactly the same accommodation as in the Russell Cottage; viz. two porches, *a*, *j*; two living-rooms, *b*, *h*; two stairs, *e*, *g*; two wash-houses, *d*, *f*; an oven and boiler room common to both houses, *e*.

2323. *Remarks.* There is much to admire in the arrangement of the plans of these cottages; though there are none of them that might not be improved, if we apply the tests of the model cottages. Nevertheless, they afford excellent hints for composition, and do great credit to the memory of the late Earl of Essex, who was a man of great taste, as well as of active benevolence; his chief enjoyment, for the latter years of his life, consisting in seeing every one about him happy.



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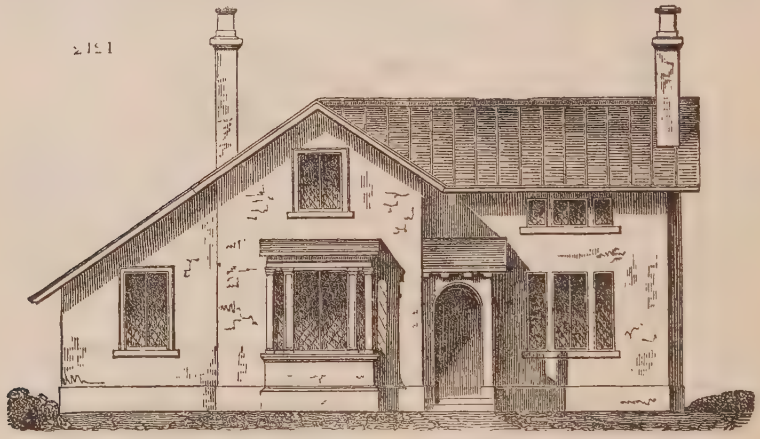
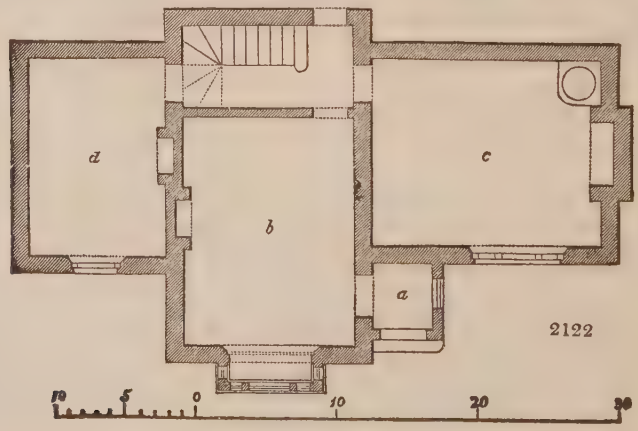
Design XXVI.—*A Gate-Lodge or Cottage.* By G. B. W.

2324. *The front or principal Elevation* is shown in fig. 2121.; the other elevations, being of less importance, are not given. Fig. 2122. is the ground plan, in which


2121

a is the porch; *b*, the living-room, or parlour, sixteen feet by twelve feet; *c*, the kitchen, sixteen feet by thirteen feet; and *d*, a bed-room, fourteen feet by ten feet.



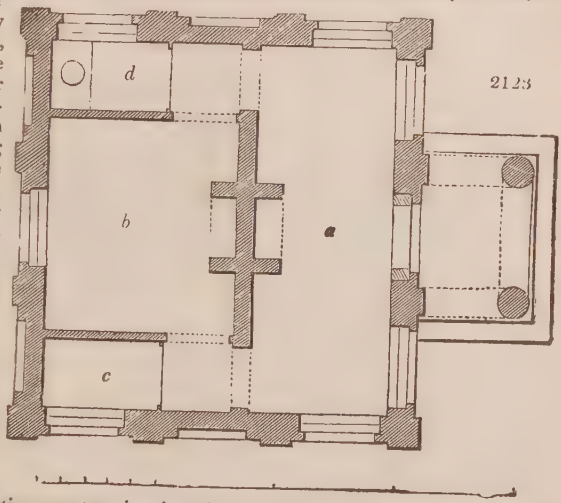
2122

2325. *Remarks.* This plan is deficient in not having a back-kitchen or a pantry, and also in the access to the stairs being through the best room.

Design XXVII.—*A Turnpike Lodge.* By W. P. G.

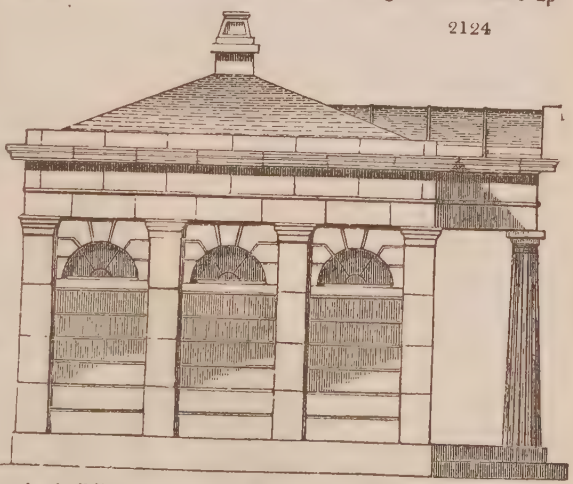
The front elevation is shown in fig. 2125., and the side elevation in fig. 2124.

2326. *The Plan* is shown in fig. 2123. The room *a* is fifteen feet six inches by six feet; one side is to be used for depositing the money and keeping the tickets, and on the other side there is room for a chair or two, for the accommodation of any person that might be waiting for the stages. The room *b* is intended, in the daytime, for the collector to eat his meals in, and at night as a bed-room, having a turn-up bedstead; *c* is a closet; *d*, a water-closet.



2123

2327. *Remarks.* The marking of the stones in the architrave is deficient in the semblance of truth; half of them appearing to rest on the wall and not on the pilasters; and the defective construction in this part is aggravated by its being conspicuously exhibited in the arches in the wall below, where it ought not to have appeared; since ostensibly these walls have no weight to bear, and might, in fact, according to the principle of Grecian construction, have been of earth. In other respects the design may pass, though the clock in the front elevation ought to have been placed on a raised panel or frame, and there ought to have been a panel for the name of the gate-keeper on the frieze over the door; and another at the end, between the pilasters, for the toll-regulations. What we mean will be, perhaps, better understood from the following remarks on the buildings at the railway stations. We greatly admire the expression of purpose in the bridges and other buildings connected with the railways, but instead of having the name of the station painted sometimes on one part of the structure, and sometimes on another, we would have had it sculptured on a conspicuous part of the front, especially designed and peculiarly characterised for that purpose; and we would have had the name itself in sunk or in raised letters; coloured, if it should have been thought necessary, but, at all events, formed either by sinking or in relief. At most of the railroad stations there are large boards, on which are painted regulations, or other information relative to matters connected with the railroad; and as these regulations may be supposed to be occasionally altered, we would still


2124

continue to have them painted on boards; but we would form panels on raised surfaces in which these boards should be fixed, or slipped in, in the same way as a picture is slipped into a frame. The panels should be made sufficiently large to admit of a larger board than might be wanted at the time the station-house was built, in order to provide room for additional regulations that may be supposed to become necessary as the traffic on the railway increases; but the board, whether covered with lines or not, should always be sufficiently large to fill the whole of the panel.

2125

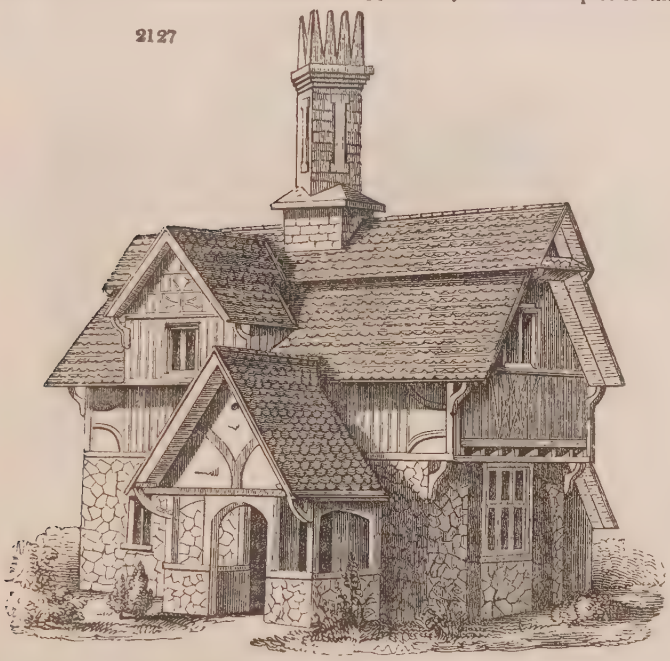
We would carry this principle of rendering writing architectural to turnpike-houses and gates, and to the signs and names of inns, public-houses, and shops to names on the gates of manufactories; to those on private doors; to the names of gentlemen's seats, which, we think, ought to be sculptured on sunk or raised panels or shields on their entrance-lodges or gates; to the names of cottages and villages; and, in short, to every architectural structure where a name was required or would be useful. Had the art of writing been coeval with that of architecture, there is little doubt that writing would have been introduced on buildings in an architectural manner, as ornaments of leaves and flowers have been, and as writing is on ecclesiastical buildings in the Gothic style. In this style the very character of the letters is architectural, and the words are always placed on scrolls or labels. It is for the modern artist to introduce writing on edifices artistically, and, in doing so, to produce something superior to the mode of putting the hieroglyphics on the Egyptian tombs or obelisks; or the letters on the jambs of the shop-doors in Pompeii, or over the doors and windows of shops in modern towns; something, in short, analogous to what is done in the Gothic style of lettering. (*Gard. Mag.* for 1842, p. 50.)

The design fig. 2126. was made for a gate-lodge to a private road through a demesne, and is very suitable for such a purpose, though by no means so for the gate-lodge of a public road. The latter seems to require a more severe style of architecture, more durable materials, and a more permanent manner of putting these together. There is a curious omission in figure 2126., viz., that of the verge-board, while the hip-knop, or finial and pendant, are inserted both in the gable end and porch, without any meaning whatever. "The [verge-boards, or] barge-boards, of gables were intended to cover and preserve the ends of the purloins and covering of the roof, which projected over to shelter the front of the building. The hip-knop which terminated the ancient gables was, in reality, a king-post fixed at the junction of the barge-boards, and into which they were tenanted." (*Pugin's Christian Architecture*, p. 39.)

Design XXVIII.—*A Cyclopean Cottage.* By William Wells, Esq.

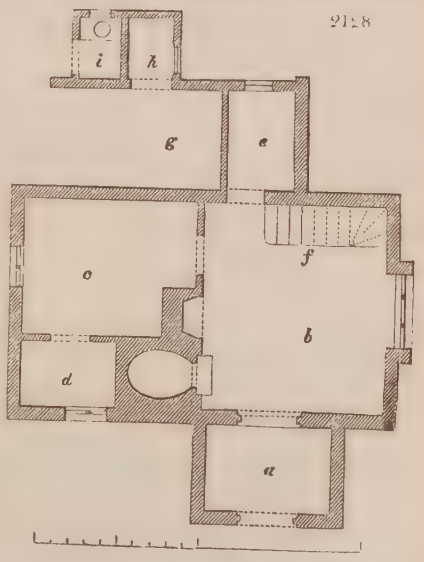
2328. The term Cyclopean, as here used, applies only to the lower part of the walls

2127



of the cottage, as shown in the elevation, fig. 2127., which are formed of irregular blocks of sandstone, without the slightest indication of horizontal or vertical courses. The effect, as contrasted with the numerous straight perpendicular lines formed by the studwork in the upper part of the walls, and with the horizontal lines of the roof, is exceedingly good. The studwork is filled in with brickwork plastered over; the smoothness and finished appearance of which, as contrasted with the rudeness of the Cyclopean part, is forcible, and at the same time pleasing. A great beauty in this cottage results from the horizontal division of the main body of the roof; the upper part of which projects slightly over the lower part. The chimney-top is massive, and original. The whole was executed by a local carpenter and mason, from the sketches of Mr. Wells, out of timber and stone produced by the estate. The plan, fig. 2128., contains a porch, *a*; kitchen, *b*; parlour, *c*; light closet, *d*; pantry, *e*; a staircase, *f*, to two good bed-rooms above, and to the cellar under the parlour below; also an open shed, *g*, for fuel; *h* is a place for rabbits or pigs; and *i*, a privy. The oven in the kitchen is shown large, to suit the description of fuel in general use by cottagers, viz. faggot wood We have shown, in our *Manual of*

2128



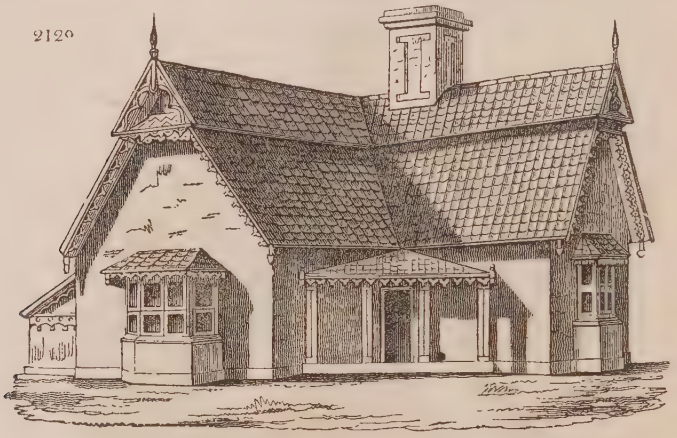
Cottage Gardening, how this fuel may be grown by every cottager for himself, provided he has an acre of ground, instead of one sixth of an acre.

Design XXIX.—*The Penshurst Gate-Lodge, at Redleaf, the Seat of W. Wells, Esq.*

The elevation is shown in fig. 2129.

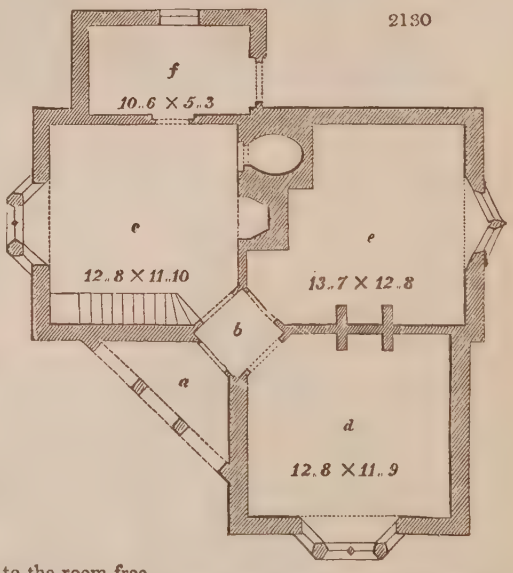
2329. *Accommodation.* The plan, fig. 2130., shows an entrance-porch, *a*; lobby, *b*;

2129



kitchen, *c*; parlour, *d*; family bed-room, *e*; and back-kitchen, *f*. From the kitchen a staircase leads to three sleeping-rooms in the roof, and down to a cellar, pantry, &c., under the parlour and family bed-room floor. A shed for fuel, which in this part of Kent is chiefly wood, a drying ground, small kitchen-garden, and other needful conveniences, are placed adjoining, and appropriately arranged.

2130



2330. *Remarks.* Much of the beauty of this cottage, and of the cyclopean cottage at Redleaf, fig. 2127., results from the break in the roof, by which the vulgarity of so large a plain surface is removed, and a second horizontal shadow obtained, in addition to that produced by the eaves; thus breaking up the plain surfaces and rendering them more picturesque. The connexion of the rooms with the lobby, *b*, is good, and there is no great objection to the stair in this case being in the kitchen, because it leaves the entrance to the room free.

This cottage forms the entrance-lodge to one of the most remarkable country seats in England; one which combines the romantic with the pastoral, and wild nature with a very high degree of horticultural cultivation and riches. A singular feature in the lawn is a rocky flower-garden, formed in an excavation, two sides of which are masses of native rock, and the other a smooth even surface, blending with the sloping lawn. In consequence of this flower-garden being sunk, no part of it is seen from the house, though it is within two or three hundred yards of it; and hence all the beauties and enjoyments of a flower-garden are obtained without injuring the romantic character of the view from the house or the main walks.

Design XXX.— *The Home Lodge at Chequers Court.* By E. B. Lamb, Esq., F.I.B.A. The elevation of the north front is shown in fig. 2131, and of the east front in fig. 2132.

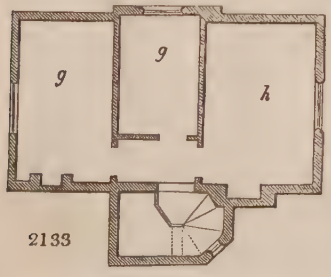
2131

2331. *The Accommodation* is shown in figs. 2133. and 2134., in which *a* is the entrance porch, communicating with a stair up to the bed-rooms and one down to the kitchens

2132

b, the living-room; *c*, the kitchen; *d*, the back-kitchen or wash-house; *e*, the pantry; *f*, a dairy; and *g*, *g*, *h*, three bed-rooms. The position of the lodge relatively to the road is shown in fig. 2135., in which *i* is the situation of the gate, and *k*, the block plan of the lodge.

2332. *Remarks.* The plan is commodious and convenient, and the elevation picturesque. The position of the stairs in the tower, opening into the lobby, is good, and the descent of a few steps from the living-room to the kitchens



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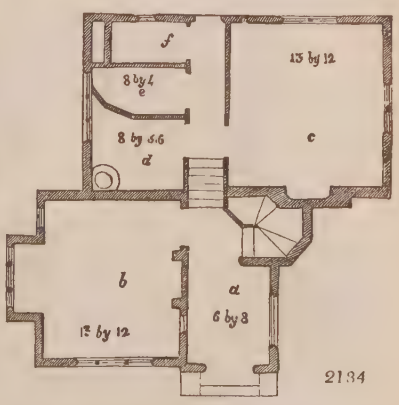
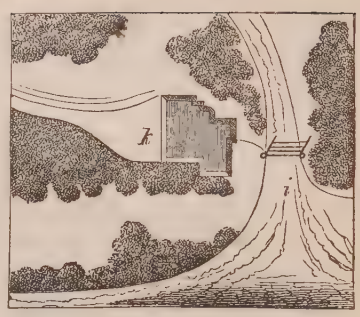


2134

and pantry enables the latter places to be made of a good height in the ceiling, without raising the exterior elevation too high; while, at the same time, it reduces the number of

2135

steps necessary for the main stair, the bedrooms being over that part of the house, and not over the living-room. This way of arranging the stairs is a great comfort both to old people and young children. This lodge was executed some years ago, with some slight variations in the tower and chimney-shafts. Sir Robert Frankland Russell, Bart., the proprietor of Chequers, is a gentleman of high artistical knowledge and taste, and both he and Lady Frankland Russell are devoted to the improvement, not only of their estates here and in Yorkshire, but of the churches and schools in their neighbourhood: both of them are amateur artists.



Design XXXI.—*The Keeper's Lodge at Bluberhouses.* By E. B. Lamb, Esq., F.I.B.A.

2136

This lodge, with some slight variations, was built for Sir R. F. Russell, Bart., on his

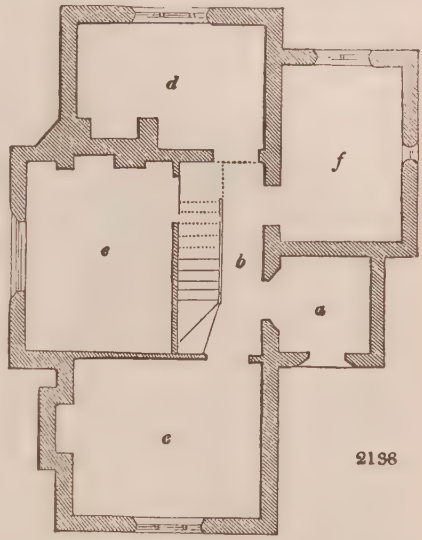
2137

estate of Thirkleby Park, in the neighbourhood of Thirsk in Yorkshire, some years ago. The entrance elevation is shown in fig. 2136., and that of the next best front in fig. 2137.

2333. *The Accommodation*, shown in figs. 2138. and 2139., is a porch, *a*; stair and lobby, *b*; parlour, *c*; kitchen, *d*; back-kitchen, *e*; pantry and dairy, *f*; and four bed-rooms, *g*, *h*, *i*, *k*.

2334. *Construction.* The walls are of stone, and the roof is covered with thin flag-stones, or what are called in some parts of the north, slate stones. One of the bed-rooms is intended for a lodger.

2335. *Remarks.* The general arrangement of the plan is consistent with the greater part of our data given in p. 1128., though by accident a small window has been omitted in the porch. The spaces between the mullions in the bed-room windows are narrower than the corresponding spaces in the ground-floor windows, which, according to one of Mr. Lamb's principles, ought never to be the case without a sufficient and obvious reason. The fault, doubtless, has been committed by the engraver, in reducing the drawings. Mr. Lamb's principle is, that all the openings for light in the same building, whether these openings are singly between jambs, or two or more together between jambs and mullions, ought to be of the same width. A certain width is taken as the element or type, and this is repeated, singly or in combination, according to the size of the apartment to be lighted, and quantity of light required, wherever a window is wanted. Another principle might be laid down with respect to the height of windows, viz., that the height of all those on the same floor ought to be the same. To this we may add a third principle, viz., that stair windows should never be on exactly the same horizontal line, and of exactly the same height, as room windows, in order that they may give externally the expression of a stair. Of course, these principles must frequently be modified by others of a higher kind; as where the window of a chapel forms part of the elevation, or those of a greenhouse or conservatory; or where the object is the imitation of some old building, in which, to render it faithful as well as characteristic, the accidental deformities must be imitated as well as the accidental beauties.



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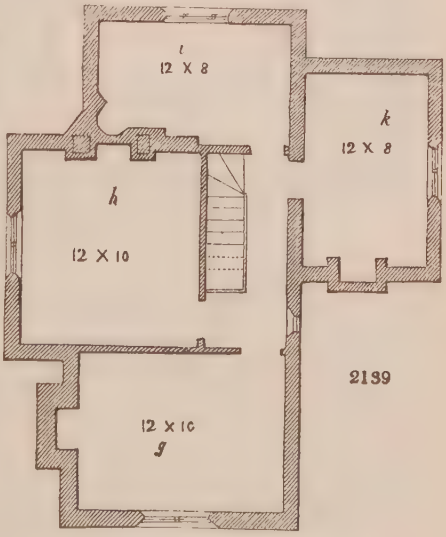


2139

Design XXXII.— *A Cottage in the Gothic Style for an Upper Servant.* By John Dobson, Esq., Architect.

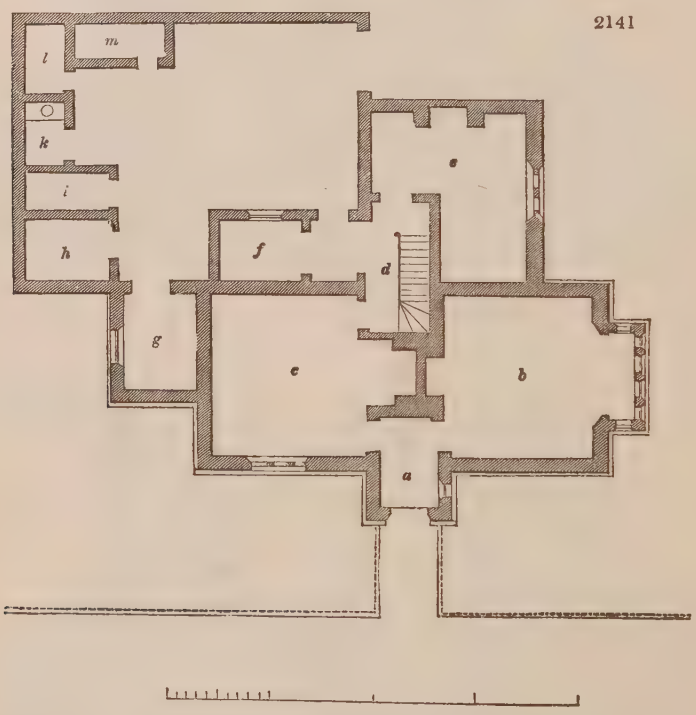
The elevation is shown in fig. 2140., and is in the genuine style of English cottage architecture, purified by the taste of an architect of genius, and of extensive experience, not only as an architect, but as a landscape-gardener. Mr. Dobson's taste in the latter art, it delights us to say, is not inferior to what it is in the former; and of his practice

in both arts examples may be seen in almost every part of Northumberland and Durham. The ground plan is shown in fig. 2141.

2140

2336. *The Accommodation* (as shown in the plan) consists of a porch, *a*; sitting-room, fourteen feet by sixteen feet, *b*; kitchen, sixteen feet by fifteen feet, *c*; staircase, *d*; scullery, thirteen feet six inches by sixteen feet, *e*; pantry, *f*; cow-house, *g*; dairy, *h*; pigsty, *i*; privy, *k*; dung and ashes, *l*; and coal-house, *m*.

2141

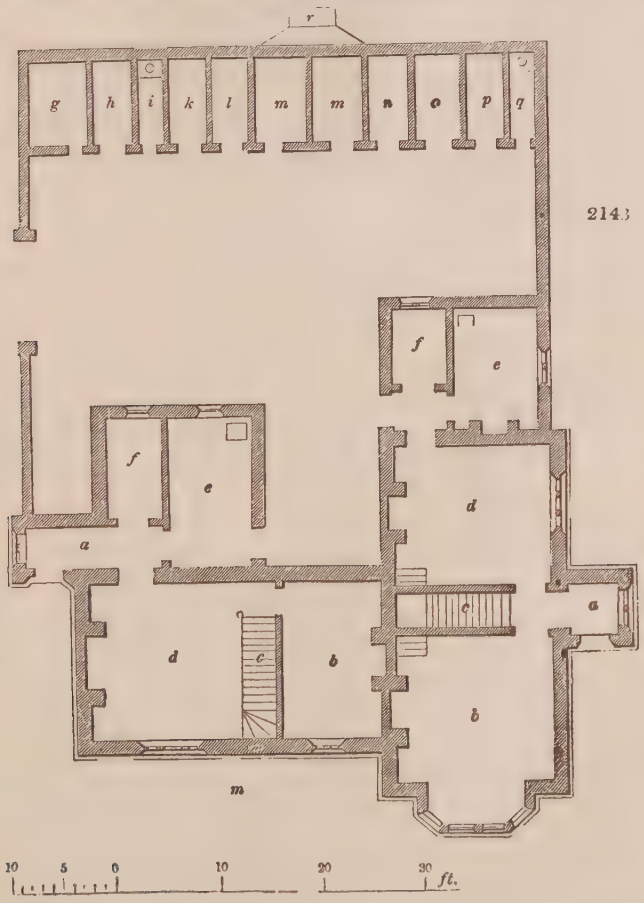


2337. *Remarks.* This cottage was designed for Richard Ellison, Esq., of Ludbrook, Lincolnshire, and contains accommodation fit either for an upper servant with a family, or a single gentleman. Of this any one will be convinced by observing the plan; the upper floor of which may contain a drawingroom over the parlour, and bed-rooms over the kitchen and scullery, or it may contain only bed-rooms.

Design XXXIII.—*Double Cottage for Two Upper Servants.* By J. Dobson, Esq., Arch. The elevation is shown in fig. 2142., and the ground plan in fig. 2143.

2142

2338. *Accommodation.* The ground plan of each dwelling exhibits a porch, *a*; sitting-room, fourteen feet by fifteen feet in one house, and ten feet by thirteen feet in the other, with a bed-room over, *b*; staircase, *c*; kitchen, fourteen feet by fifteen feet in one house, and eighteen feet by fifteen feet in the other, with a bed-room over, *d*; scullery, *e*;



2143

pantry, *f*; dung-pit, *g*; place for ashes, *h*; privy, *i*; coal-house, *k*; pigsty, *l*; cow-houses, *m m*; pigsty, *n*; coals, *o*; dung and ashes, *p*; privy, *q*; liquid-manure tank, *r*;

2339. *Remarks.* The arrangement of the plan is very ingenious, and the elevation is eminently picturesque. With a view to the liquid manure, the two privies ought to have been placed next to the two cow-houses, and next to the privies the pigsties; because this would have facilitated the conducting of the liquids from these places to the central tank. It is very possible, however, that this oversight may have been made in sketching the plan, which Mr. Dobson most kindly did for us entirely from memory. He also furnished us with a plan for a treble cottage, which we much regret that time has prevented us from having engraved. We shall, however, publish it in the *Gardener's Magazine*. We have shown, in the *Suburban Horticulturist*, how the walls and roofs of fig. 2142. may be covered with grape-vines trained on Mr. Hoare's principle, by which a pound of fruit is produced on every square foot of wall or roof.

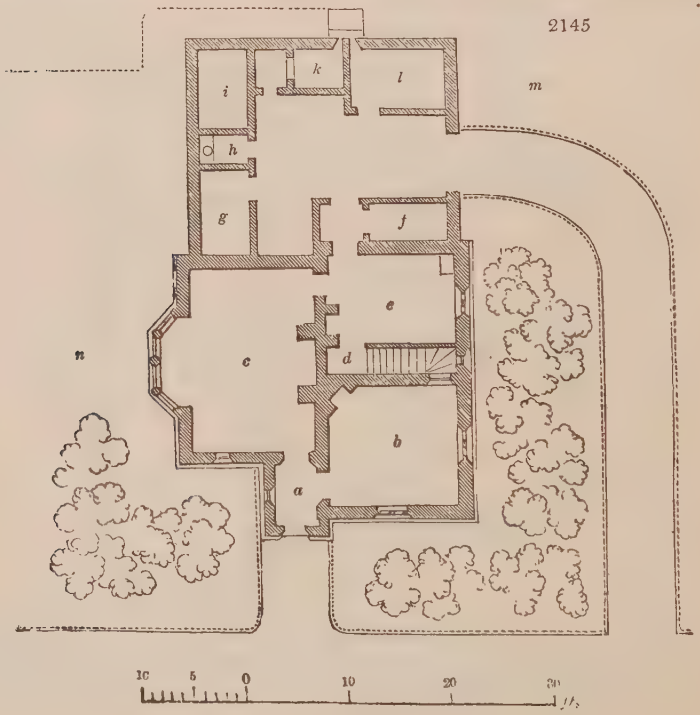
Design XXXIV.—*A Cottage in the Old English Style.* By John Dobson, Esq., Architect.

The elevation is shown in fig. 2144., and the ground plan in fig. 2145.

2144

2340. *Accommodation.* The ground plan shows a porch, *a*; sitting-room, twelve feet

2145



square, *b*; kitchen, twelve feet by eighteen feet, *c*; stair, three feet wide, *d*; scullery, ten feet by twelve feet, *e*; pantry and dairy, *f*; coal-house, *g*; privy, *h*; dung and ashes, *i*; pigsty, *k*; and cow-house, *l*. There is a communication from the cow-house and the pigsty to a liquid manure tank, which is placed behind so as to be centrical to both. There is a wood at *m*, and the garden is at *n*.

2341. *Remarks.* The privy, as we think, ought to have been placed adjoining the cow-house or the pigsty, for the sake of the liquid manure. We should have preferred placing the staircase so as to open into the porch, for Mr. Wilson's reasons, mentioned § 2252.; but this is perhaps being too fastidious. In every other respect we approve of the plan, which is compact, and contains every thing that could be wished; and the elevation we think admirable. This cottage was executed at Lilburn, in Northumberland.

Sect. IV. *Construction and Materials of Cottages.*

2342. We have little to add to what is contained in the Encyclopædia. Some improvements have been made in cottage windows by the Highland Society, and by the Messrs. Strutt of Derby, which will greatly reduce their price and facilitate ventilation. A mode of building brick walls, fourteen inches in thickness, with a very few more bricks than what are required for a solid nine-inch wall, deserves attention for its greater economy and warmth, and also because a wall so constructed can be carried to a greater height without piers than a solid nine-inch wall. The patent brick walls of Mr. Hitch promise to be very durable and economical, though, like other deviations from routine practice, they have not yet become so general as they deserve to be. The mode of building walls of "clay lumps," practised in Suffolk, appears to be both durable and economical, and to make a very dry warm cottage. Cottages that have only walls nine inches in thickness, and roofs covered with slates or tiles, must necessarily be exceedingly cold in winter and too hot in summer; in the former case requiring a great expenditure of fuel, which is almost everywhere scarce and dear. If the walls of a cottage were made two feet in thickness, and the roof covered with one foot in thickness of thatch, heath, spray, or the chips of woodmen, they would be warmer in winter (the floor being perfectly dry) almost without fire, than they are now with it. Whatever heat was generated in the cottage could neither escape through the walls nor the roof; and if the building was placed so that the sun shone on every side of it every day in the year, great part of the heat which was radiated externally from the walls and roof during the night would be replaced during the day. As there is a prejudice against thatch in many parts of the country, there should, where tiles or slates are used, always be a plastered ceiling to the rooms in the roof, made air-tight, and enclosing a vacuity between the plaster and the slates of at least a foot, so as, in fact, to form a double roof: this is the nearest approach that can be made to a thatched roof. If the durability of timber, and especially of young native timber, could be increased by any of the compositions, such as Burnett's, now being experimented with, it would greatly lessen the first cost of cottages, as well as increase their duration. As most of the improvements in the construction of cottages which we have to notice are applicable to farm buildings, and in part to villas as well as to cottages, we have brought the whole together in our fifth chapter, p. 1245., to which we refer the reader. (See Contents in p. 1124.)

Sect. V. *Cottage Fittings-up and Furniture.*

2343. *Little Improvement* has been made in this department. A cheap and economical cottage fire-grate is still a desideratum, and probably will continue to be so till a change takes place in cottage cookery, roasting against open fires is dispensed with, and the value of stews understood. The most economical stove for warming a cottage, and at the same time for cooking food, is, beyond all doubt, in our opinion, the Bruges stove, but unfortunately it cannot at present be procured under £7. If, indeed, there were a general demand for these stoves, they might probably be manufactured at little more than half the price, but the difficulty is to introduce them at all. Next to this stove we would recommend one in very general use, which has a small fireplace in the middle, an oven at one side, and a boiler for water at the other; they cost from £1 to £3 each at the wholesale cast-iron warehouses. If these are carefully set, and the throat of the chimney contracted, so as not to create too great a draught, a good deal of heat will be thrown out into the apartment, though nothing like so much as by the Bruges stove; which, being of iron except the fire-pot, supported on legs, and completely isolated except by the connexion of its small smoke-pipe with the chimney, radiates heat on every side. In various parts of the country a brick oven is used, heated by faggot-wood; and if it could be so contrived that this oven could be placed below the kitchen floor, and the smoke conducted from it in a flue under the floor, a large portion of heat now lost would be saved. There is, however, a prejudice against this mode of adding

to the heat of a cottage; and, therefore, though we have indicated it in our model designs, we do not expect it will be much followed at the present time. Were some such stove as the Bruges stove employed, such a mode of heating would be in a great measure unnecessary. An improvement has been made in the box bedstead which deserves adoption where that kind of bed is still used; and some minor improvements in furniture and fittings-up, applicable to cottages, will be found in our sections on fittings-up and furniture, in a subsequent page.

Sect. VI. *Villages.*

2344. *The congregating of Cottages in Villages* is attended with many advantages and with very few inconveniences. The advantages are: society; the use of certain articles in common, such as a well or other source of water; a common sewer for drainage; a school; a public wash-house and drying-green; a general play-ground for children; a village library and reading-room; and, if the village is large, a church or chapel, not to mention the proximity of village tradesmen, mechanics, &c. The chief disadvantage that we know is, the distance to which agricultural labourers and out-of-door country mechanics, such as carpenters, masons, &c., have to go to and return from their work. On the Continent, and in this country, cottages and farm-houses were formerly collected together in villages for mutual protection against thieves and wild beasts, and in a more civilised and refined state, they are, or will be, similarly congregated for social comforts and enjoyments. These comforts and enjoyments might be greatly increased, were the art of cooperation for their attainment properly understood; were the village to have a common kitchen, dining-room, wash-house, dairy, &c., as well as a common school and church: but the time has not yet arrived for improvements of this kind, and it would be of little use attempting to introduce them, till every member of society is enlightened and refined by a general system of education, which shall comprehend every kind of useful instruction, communicated alike to all, even the poorest, up to a certain age. Such a national education as we contemplate already exists in some parts of North America and Germany, and will unquestionably, sooner or later, be introduced into this country; but, in the meantime, we must take men as they are, and endeavour to suggest what may be useful for the present generation.

2345. *Rows of Cottages.* Next to congregating cottages together in villages, that of placing them in rows or groups of half a dozen or a dozen is to be recommended; because in this state one cottager may assist another in case of distress, and there is also an opportunity given to the families to mix together occasionally, without which there can be no civilisation. But though such a congregating of cottages as admits of the families associating together at pleasure is desirable, it ought not, in the present state of things, to be carried so far as to compel any two families to come constantly in contact. The selfishness and bad passions are not yet sufficiently under control, nor the benevolent feelings sufficiently developed, for this purpose. For this reason we would as seldom as possible join a row of cottages like the houses of a street, but rather isolate each by surrounding it with its garden. In some cases one family occupies the ground floor of a cottage, and another the floor above, which is in general very disagreeable to both parties. This is also the case when two families enter through the same porch, or through the same front garden, or when cottages joined together have only thin party-walls. Complete isolation, therefore, ought, if possible, to be joined to congregation.

2346. *Solitary Cottages*, such as gate-lodges, cottages for game-keepers, gardeners, &c., are generally not merely isolated, but solitary; but common humanity requires that this solitariness should be mitigated by building some dwellings for persons of similar condition near them. For example, the habitations of the gardener and bailiff might frequently be placed at no great distance from each other, and the dwellings of the carpenter, mason, hedger, and woodman, of a large estate, might form a group. It is unnecessary, however, to go into details; it is sufficient to direct attention to the general principle, founded as it is on the fact, that man is a social animal, and only to be improved in manners and increased in happiness by social intercourse.

2347. *Laying out Villages.* The most beautiful villages in Britain are, for the most part, the result of accident, heightened by the taste of the proprietor of the estate; as, for example, in the case of Dirleton, one of the handsomest villages in Scotland, or of Harlaxton, one of the most picturesque in England. There are many very formal and disagreeable villages, designed purposely to be ornamental, or to give consequence to the entrance-lodge of a mansion; and if we compare these with an agreeable village that has sprung up by accident, we shall soon find what we should imitate and what we should avoid. In villages the houses ought never to be put down in rows, even though detached, unless the ground and other circumstances are favourable for a strictly regular or symmetrical congregation of dwellings. There is not a greater error in forming artificial villages, or in placing houses by road-sides, either singly or in rows, than always

having one side of the building parallel with the road. Instead of making this a leading principle in the country, it ought to be a subordinate one; since it is unfavourable both to the comfort and enjoyment of the cottager, and the beauty of the cottage and the scenery. It is unfavourable to the comfort of the cottager, because it often requires his cottage to be set down with one side to the south and another to the north; whereas, as we have shown in a hundred places, one of the fundamental principles of setting down a house, whether a cottage or a palace, ought to be to place it so that the diagonal to its square shall be a south and north line. It is unfavourable to the cottager's enjoyment, because, as the principal room is generally placed next the road, the occupant is forced to look directly across the road, which is the dullest and stupidest view that the situation admits, and not for a moment to be compared with looking obliquely across or along the road; while, if the front is to the south, it is impossible for the occupant to look out at the windows during the finest part of a sunny day. These arrangements are unfavourable to the picturesque beauty of the cottages composing the village, because it necessarily produces a great degree of sameness in the manner in which they group with the scenery. On the other hand, when the principle of the diagonal line is constantly kept in view, the cottages on both sides of a road, even if they were built all of the same form, can never be placed in the same manner; and the moment the idea of the usual dull repetition of the same forms in the same relative positions is got rid of, that moment the idea of picturesque beauty begins: the cottages will be put down in all manner of positions; some will be nearer the road than others, some will look across it at one angle, and some at another; if the general surface of the ground is uneven, some will stand on a higher level than others; and if the direction of the road should be any other than straight, the general effect will be every thing that could be wished. It cannot be too strongly impressed on the mind of the reader, that the idea of putting down all cottages that are built along a road with their sides or ends parallel to that road is destructive of all picturesque beauty. The idea of doing so can only have arisen from the practice of building streets in towns, where the great value of the land obliges the builder to place the houses as close together as possible, and where, in consequence of this, the only part seen by the public is the front; but even in towns, where this continuity of frontage is interrupted by projecting buildings and retiring ones, the beauty and variety of the elevations is greatly increased.

2348. *Every Character of Surface is adapted for a particular Character of Village*, but on all surfaces it is necessary to the full enjoyment of the advantages of congregation, that there should be a certain degree of concentration. Every cottage in a village should be surrounded with its own garden ground, and nothing more. If fields are allowed to intervene, the too great separation of the cottages will interfere with the advantages of concentration. Nevertheless, we are far from asserting that all the cottage gardens ought to be of the same size; on the contrary, variety will be produced by a difference in this respect, as well as by a difference in the accommodation and style of the cottages. The dwelling of the clergyman and of the schoolmaster will not only be larger than the others, but will have more ground attached; and there may be a row of almshouses with very little ground, and, in the outskirts of the village, a union workhouse with a great deal. The most favourable surface for a regular or symmetrical arrangement of roads and dwellings is one that is perfectly even. In a village on such a surface all the water will generally be obtained from wells. A village on a knoll, with the church or school in the centre, will not be so favourably supplied with water; but one on the side of a hill will generally have water in abundance, which, as it descends from the upper to the lower part of the declivity, may form a succession of fountains of different kinds, which is beautifully effected in the village of Great Tew in Oxfordshire; and will generally prove highly ornamental as well as useful, because, without abundance of water, there can be no efficient cleanliness. In all villages there ought to be a system of drainage for carrying off the superfluous rain and subsoil water, and the overflowings of the liquid-manure tanks; though, if these tanks are properly attended to, they will never be suffered to run their precious contents to waste. Villages along rivers or streams ought always to have an intercepting drain close to the river, and parallel with it, to keep its waters pure, and at the same time to remove from the village what is superfluous. It is almost needless, to observe that the main drain of a village, like that of a field, ought to commence at a lower level than that of the surface to be drained, and that this may frequently be at some distance. It is no part of our business here to speak of the sewerage of large towns, otherwise we would recommend to notice the improvements suggested for the London sewers by Mr. Roe in the *Sanitary Report;* nor does it form part of our plan to speak of the formation of towns, otherwise we should refer to Fleetwood in Lancashire, one of the best arranged artificial towns, and at the same time one of the most prosperous in the empire. We shall conclude this section by an account of the village

of Harlaxton in Lincolnshire, the property of Gregory Gregory, Esq., of Harlaxton Manor, a gentleman of the most refined taste in architecture and gardening, and who devotes his time and his income to the display of these arts on his estate in a manner which we cannot sufficiently admire.

2349. *The Village of Harlaxton* is situated about nine miles from Grantham, in Lincolnshire, and occupies a portion of the bottom of a broad fertile valley, through which runs a stream of pure water, that expands into a broad pond near the ancient Manor House of Harlaxton, one of the oldest manorial dwellings in England. We have seen many ornamented villages, both at home and abroad, but none so original, and so much to our taste, as this of Mr. Gregory's. Some of old date are too like rows of street houses, such as those of Newnham Courtenay near Oxford, and Harewood near Leeds; others are too affectedly varied and picturesque, such as that at Blaize Castle near Bristol; and some have the houses bedaubed with ornaments that have not sufficient relation to use, as when rosettes and sculptures are stuck on the walls, instead of facings being applied to the windows, porches to the doors, and characteristic shafts to the chimney-tops. We recollect one near Warsaw, which is a repetition of the Grecian temple, with a portico at each end; and one at Peckra, near Moscow, every opening in which has a pediment over it, with highly enriched barge-boards. In some villages, the attempt is made to ornament every house by trelliswork round the doors and windows, which produces great sameness of appearance, and, if ornamental, is so at the expense of comfort; the creepers, by which the trelliswork is covered, darkening the rooms, and encouraging insects; while, in other villages, the cottages are so low and so small, that it is obvious to a passing spectator that they cannot contain a single wholesome room. However, though we find fault with villages ornamented in these ways, we are still glad to see them; because any kind of alteration in the dwellings and gardens of country labourers can hardly fail to be an improvement on their present state, both with reference to the occupiers and to the country at large.

The great value of Mr. Gregory's improvements in the village of Harlaxton is, that all the leading features have some kind of relation to use, and are, in fact, to be considered more as parts added to the very plainest cottages, in order to render them complete, than as ornaments put on to render them beautiful. All the cottages were built by Mr. Gregory's predecessor in the plainest possible style, but fortunately substantial and comfortable, and two stories high; some of them single, and some of them double; and almost all of them of stone, some yards back from the street, and surrounded by ample gardens. In improving them, Mr. Gregory would appear to have been guided by the following considerations: —

1. *To bestow the principal expense on the main features, such as the porch, the chimney-tops, and the gardens.* Almost all the cottages have porches, some projecting from the walls, and others forming recesses: the latter have sometimes open places like loggias over them; and the former, sometimes roofs in the usual manner, sometimes balconies, and occasionally small rooms with gable-ends, or pavilion roofs, according to the style. The greatest attention has been paid to the chimney-tops, which are in some cases of brick, and in others of stone; sometimes of English domestic Gothic, at other times local English, such as those common in the neighbourhood of the Lakes or in Derbyshire, &c.; Italian, French, or Swiss, chimney-tops, of different kinds, also occur. The gable-ends are finished with crow-steps in the Belgian and Scotch style in some cases, with Gothic parapets in others; and various descriptions of barge-boards are used, wherever the roof projects over the end walls. Porches, cornices of brick or stone, ornamental cornice boards, and stone or wooden brackets, are also introduced in front, as supports or ornaments to the roof. Every garden has been laid out and planted by Mr. Gregory's head gardener; creepers and climbers being introduced in proper places, in such a manner as that no two gardens are planted with the same climbers.

2. *Always to have some architectural feature in or about the garden, as well as on the cottage.* For example, almost every garden here has its draw-well, and each of these wells is rendered architectural, and ornamented in a different way. All the wells are surrounded by parapets, either circular or square, of openwork or solid. Some are covered with roofs supported by carpentry, others with roofs supported by stones, round or square; some are in the form of stone cupolas: in some, the water is raised by buckets suspended from a picturesque architectural appendage; in others, it is raised by pumps attached to wooden framework of most original construction, massive and architectural; and so on. All the gardens are of course separated from the street by a fence, and there are not two of these fences in the village exactly alike. Some are hedges rising from the inside of dwarf walls; some are walls like those of sunk fences, the garden in the inside being of the height of the top of the wall, which is covered in some cases with a plain stone coping, in others with a brick coping; in some with a stone coping in the Gothic manner, in others with an Elizabethan coping; in some with a parapet of open-

work, in others with stone or brick piers for supporting horizontal bars of wood for creepers, as in Italy, or without being connected by bars of wood, but terminating in rough earthenware jars for flowers. Each front wall must, of course, have a gateway to enter to the garden and the cottage, and no two of these gateways throughout the village are alike. Some are wickets between wooden posts, others Gothic or Elizabethan gates between stone piers, square or round; some are close gates, in the manner of many in Switzerland, in others the gates are under arches, some of which are pointed, and others round-headed; some have pediments over the arches, others horizontal high-raised copings, as in the neighbourhood of Naples; and some have small wooden roofs or canopies after the manner of the gateways to the country houses in the neighbourhood of Dantzic. The gateways, in short, afford great variety of character. Besides the front boundaries of the gardens, there are the side boundaries, which are also varied, partly in a similar manner, and partly differently. In some cases, the boundary, though sufficiently well known to the occupants, does not appear at all to the stranger; in others it is of holly, of box, of laurel, of thorn, of flowering shrubs, of fruit trees, or of a mixture of several or all of these, with or without architectural piers, bee-houses, arbours, covered seats, tool-sheds, or other appendages. The gardens, it may be observed, are all laid out differently. In some, the main walk from the street gate to the porch is of flagstone, in others it is paved with small stones; in some with wood, in others with brick; in some with gravel, and in others with broken stone It is edged with box, with thyme, with ivy, with a broad belt of turf, with a raised edging of stone, or with a flat belt of brick, and sometimes even with wood. The gardens are variously planted, and in some there are very properly trees and shrubs clipped into artificial shapes; two spruce firs form very handsome balls.

3. *Never to employ two styles or manners of architecture in the same cottage, or at all events not to do this so frequently as to lead a stranger to suppose that it has been done through ignorance.* We omit what may be said on the necessity of keeping the recognised eras of the Gothic distinct, as well as the Elizabethan, Swiss, Italian, &c., as sufficiently obvious. In every cottage and its accompaniments, the appearance of one system of construction should prevail, as well as one prevailing direction in the lines of the masses. For example, in a Swiss cottage, with its far projecting eaves and its surrounding balcony, horizontal masses, lines, and shadows are decidedly prevalent; and, beyond a certain point required for contrast, it is not desirable to introduce any vertical masses, lines, or shadows. The windows, therefore, in such a house, should be broad rather than high; and, as those of the ground floor are protected from the weather by the balcony, and those of the upper floor by the projecting eaves, the very simplest form of dressings to the doors and windows is all that is required. To surround them with rich dressings, or protect them by cornices or pediments, such as indicate the purpose of throwing off the rain, or casting a shade on the glass, would be in bad taste, because it would be superfluous, or working for an end that could not be attained; it would, in fact, be counteracting nature, and setting at nought the principles of art; not to speak of weakening the associations connected with style independently of the use of parts of walls and roofs.

4. *Not altogether to omit objects purely ornamental, where they can be introduced with propriety.* There is no reason why a cottage garden should not have its sculptural ornaments as well as the garden of a palace; and it is quite reasonable that in both cases the occupant should endeavour to get the best ornaments he can afford. Formerly, the doctrine used to be, that the dwelling of the cottager ought to be low, in order to be expressive of humility; and void of exterior ornaments except creepers and flowers, to express the condition of life, or, in other words, the poverty of the inhabitant. But the cottager is now becoming a reading and thinking being; and having a taste for health, comfort, and ornament, in common with other classes of society, he requires higher and better lighted and ventilated rooms; and these, as well as his garden, he will ornament as far as his circumstances will permit. The time has gone by for one class of society to endeavour to mark another with any badge whatever; and therefore we would wish all architects, when designing cottages, to abandon their long received ideas. "In the construction of cottages, as well as of all other kinds of buildings, great care should be taken that every part should be in its proper character; for nothing can appear more absurd or out of place, than to see mouldings or ornaments which belong to the regular styles of architecture introduced in a cottage." This was published in 1805, in a work on Labourers' Cottages, by an architect of eminence; but in 1840, in the recently improved cottages throughout the country, we see the "mouldings and ornaments which belong to the regular styles of architecture" as carefully applied as in larger dwellings; and, fortunately, vases of the most elegant forms are so cheap, that no cottage parapet, seat, or bee-house, need be without them. What is most offensive to taste, both in the gardens of the wealthy and of the poor, is the misplacing of sculptural ornaments. In

Harlaxton village there are sundials and vases, of different forms and kinds, most judiciously placed; for example, as terminations to piers to gates, or along parapets on piers or other preparations, on the piers at the ends of stone seats, &c. In how many instances, not only in cottage gardens and on cottages, but in the gardens and on the buildings of the wealthy classes, do we not see vases set down where they have no legitimate right to be placed whatever; in places from which they might be removed without ever being missed, or without any derangement to the scene in which they were put, but of which, in an artistical sense, they formed no part. Some of the situations proper for vases are: where the vase forms a termination to an object, as to a pillar of a gate, a pier or pilaster in a wall, or a detached column, &c.; where lines of walks or of walls join, meet, or intersect, as in the centre of a system of beds for flowers, or at the angles made by the junction of walks in a pleasure-ground; where niches in buildings, or gravelled or other recesses along walks, are prepared for them, &c. In all cases where a vase is put down in a garden, it ought not only to have a base formed of one or more plinths, but a pedestal to raise the vase nearer the eye, and above the surrounding vegetation, as well as to give it dignity of character. No ornament whatever, whether in a garden or on a building, ought ever to be placed in an inconspicuous situation, or in the less noble parts of the grounds or edifice; and no ornament ought to be made use of which is formed of a material of less value or durability than the material or object on or against which it is to be placed. Hence the bad effect of rootwork and rusticwork in many situations in gardens, and in verandas and other additions or accompaniments to brick or stone houses

5. *To indicate the occupation of the inhabitant, where it can be done.* For example, the smithy, or blacksmith's forge, when properly introduced, can never be mistaken, nor the carpenter's shop. These two village tradesmen require houses, yards, and gardens, peculiarly arranged, and afford fine sources of variety. The shoemaker may have his stall as a projecting appendage, and the tailor his workshop. Some of the cottagers will possess cows, others pigs or rabbits; some pigeons, and all more or less poultry. The provision required to be made for these kinds of live stock affords interesting sources of architectural and picturesque effect; though in small villages a common cow-shed, as well as a common bakehouse, wash-house, and drying-ground, is frequently found preferable. The house of the schoolmaster adjoining the village-school, and the house of the clergyman near the church, will always be principal objects; and shops for the sale of different articles speak by their windows. Every large village ought to have an open shed, or other public building, in a central situation, to serve as a kind of market or gossiping place, and also as a playground, or place of amusement, for the boys in rainy weather.

Whoever intends to ornament and improve a village, we would strongly recommend to study Harlaxton. It is impossible to reflect on that village without imagining what a continued scene of ornament and appearance of comfort all England, and even all Europe, would present, if proprietors would follow the example of Mr. Gregory. Happily, in this country, many have been engaged in this work for a number of years, and considerable progress has certainly been made. Though the best mode to succeed is to have the very best advice at the commencement, and submit every elevation that is to be carried into effect to an architect of taste, yet let those who do not value advice of this kind make the attempt with what knowledge they have, or can derive from books, or from observing what has been done by others, and they cannot fail to do good to a considerable extent. The way to insure artistical buildings throughout the country is, not so much here and there to employ a first-rate architect, who may erect a splendid mansion with a handsome cottage as an entrance-lodge, as to create a demand for architectural taste and knowledge among country builders, carpenters, masons, and bricklayers, generally, since it is by these persons that the great majority of country buildings are both designed and executed. For the general improvement of cottages, therefore, we must educate the eye of the country carpenter and mason, and give the cottager himself a taste for architectural and gardenesque beauty.

The Village of Edensor at Chatsworth, which was beginning to be improved when we last saw it in 1839, is said by a writer in the *Gardener's Chronicle* to be a dell gradually opening as it descends gently towards the park, profusely studded with architectural gems. "The buildings embrace houses of almost every calibre, from the spacious farmhouse to the humble cottage, and they are distributed with admirable skill; some on the level ground at the mouth of the dell, and others on gentle declivities, while not a few overhang the brow of a precipice, or occupy a snug position that has been excavated out of the solid rock. The buildings are entirely of stone, except where enriched wooden gables or other ornamental carvings have been introduced; and they present a perfect compendium of all the prettiest styles of cottage architecture, from the sturdy Norman to the sprightly Italian." (*Gard. Chron.* for 1842, p. 187.)

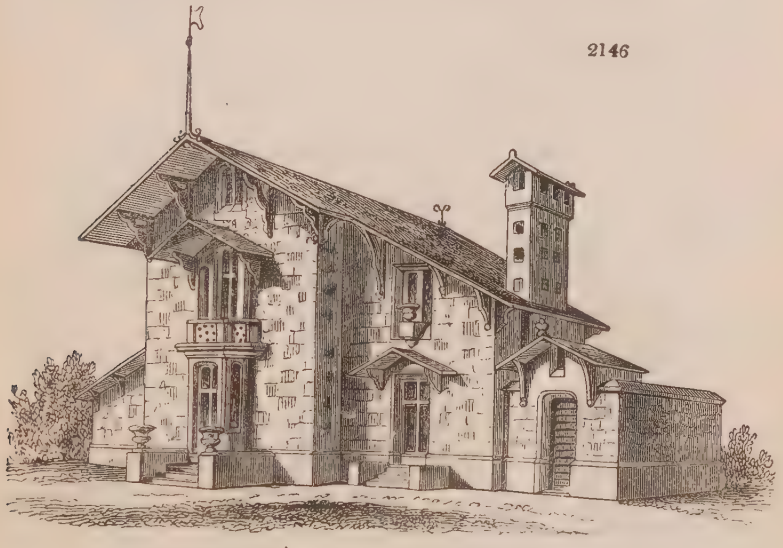
Chap. II.

Cottage Villas and Villas.

Design I.—*A Villa in the Swiss Style.* By E. B. Lamb, Esq., F.I.B.A.

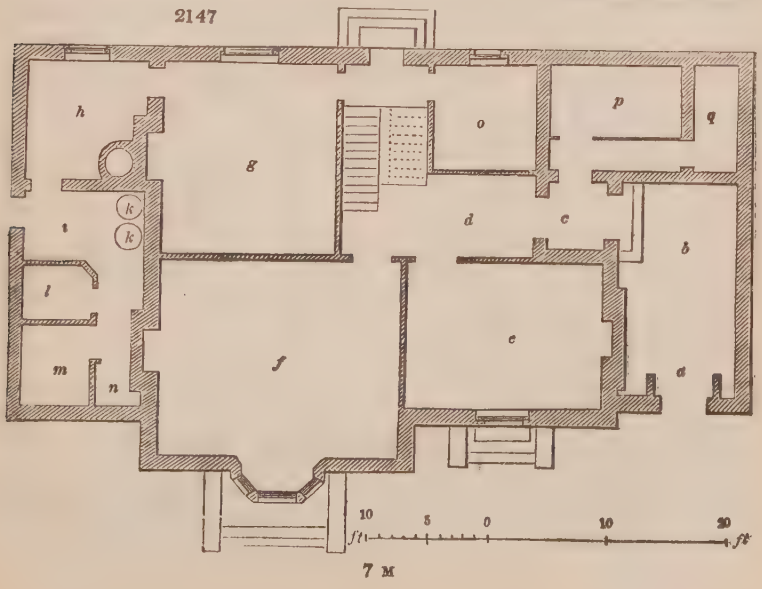
The elevation is shown in fig. 2146., and the ground plan in fig. 2147.

2146



2350. *Accommodation.* The plan shows a covered doorway, with the house-bell over, *a*, entrance-court, *b*; porch to the house, *c*; hall, and staircase to drawingroom and bedrooms, *d*; study, sixteen feet by twelve feet six inches, *e*; dining-room, twenty feet by

2147



sixteen feet six inches, with drawingroom over, *f*; kitchen, sixteen feet by fifteen feet, *g*; back-kitchen, with boiler, *h*; kitchen-court, *i*; two butts for holding the water from the roof, *k k*; place for dust and ashes, *l*; for coals, *m*; and servants' water-closet, *n*.

2351. *Remarks.* This design was made by Mr. Lamb for John Murray, Esq., the author of many esteemed works on natural and experimental science, who intends it for a very interesting situation on his property in the neighbourhood of Stranraer. Here it will be backed by a steep wooded bank on which Mr. Murray has created various interesting scenes and walks, and will have a rich garden immediately before it, bordered by the magnificent bay of Stranraer, and in the distance a range of mountains. It will be executed at a very moderate expense, from there being abundance of stone on the spot, and from the great simplicity of the roof, which does not contain a single gutter, and on which there are neither hips nor valleys. The estimated cost is about £650. In the neighbourhood of London it would cost considerably more.

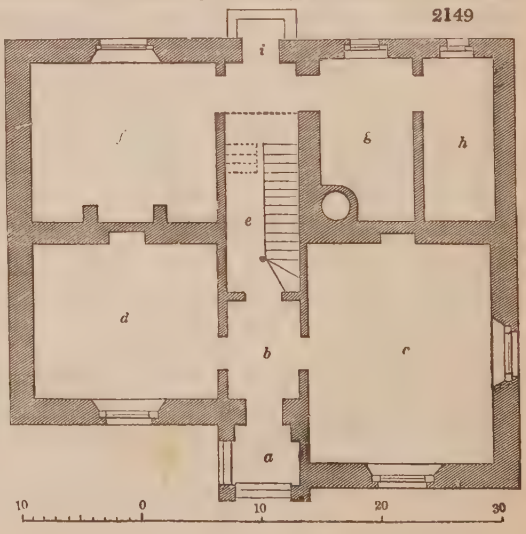
Design II.—*A Villa adapted for a Situation in the Neighbourhood of Ayr.* By E. B. Lamb, Esq., F.I.B.A.

The elevation is shown in fig. 2148., and the ground plan in fig. 2149.

2148

2352. *Accommodation.* The plan shows a porch, *a*; hall, *b*; dining-room, eighteen feet six inches by fifteen feet, *c*; parlour, fifteen feet six inches by thirteen feet six inches, *d*; staircase, with closet under, *e*; kitchen, *f*; scullery, *g*; pantry, *h*; and back entrance, *i*. In the floor of the dining-room, *c*, there is a bath, the lid to which opens like a trap-door, and the descent is by steps, as in the design for a parsonage-house, by Mr. Barry, in p. 841. The bath is supplied with hot water from the boiler in the scullery, *g*, and with cold water from a cistern also in the back kitchen.

2149



2353. *Remarks.* This design was made for a situation in the neighbourhood of Ayr, nearly flat, with a command of the sea. The walls are of freestone, and of considerable thickness to insure warmth. The design is massive and original. The estimated expense is about £500.

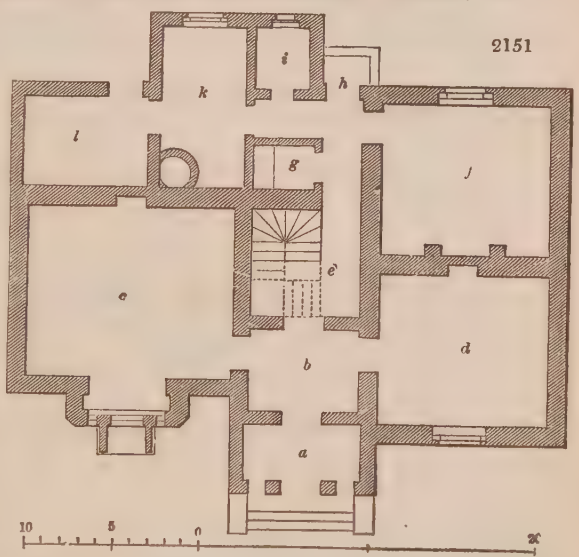
Design III. — *A small Villa in the Modern Style.* By E. B. Lamb F.I.B.A.

The elevation is shown in fig. 2150., and the plan in fig. 2151.

2150

2354. *Accommodation.* The plan shows an entrance-porch, *a*; hall, *b*; dining-room, twelve feet by ten feet, *c*; parlour, ten feet by nine feet, *d*; staircase, with closet under, *e*; kitchen, ten feet by nine feet, *f*; water-closet, *g*; back entrance, *h*; pantry, *i*; scullery, *k*; and place for coals and lumber, *l*.

2151

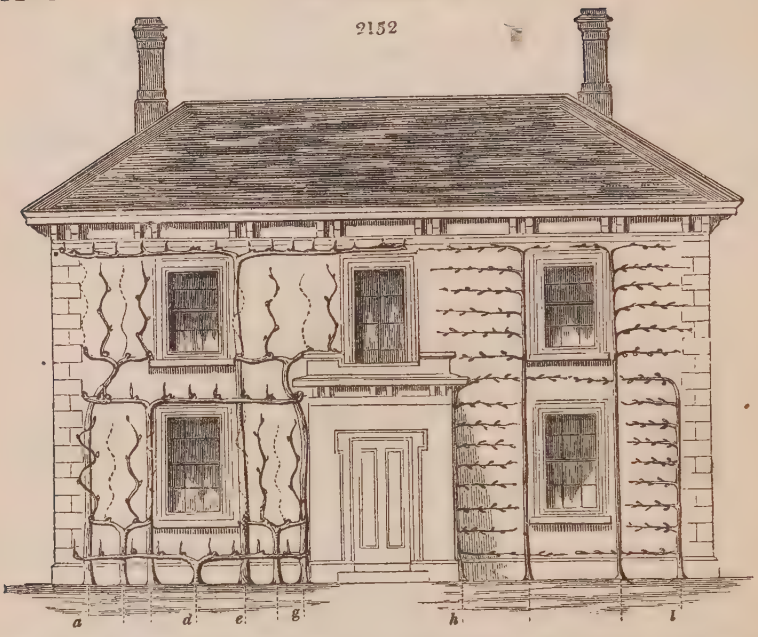


2355. *Remarks.* The staircase is lighted from the tower, and there may be a borrowed light either from the staircase or the passage to the water-closet, which, being completely within the house, is less likely to be injured during severe frosts. As the situation is on a level with the sea, and quite near it, a salt-water bath might easily be contrived in a cellar, or under the floor of one of the parlours. **Estimated expense about £500.**

Design IV. — *A small Villa for a Gentleman much attached to Gardening*

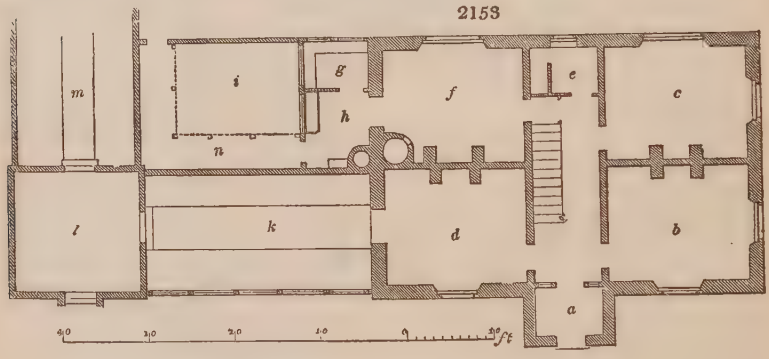
2356. *Covering the Walls with Vines or Fruit Trees.* Fig. 2152. is the front elevation of this design, in which is shown the manner of covering the walls of a house with vines and fruit trees. There are seven vines, *a* to *g*; and four fruit trees, *h* to *l*. The vines *d* and *e* are trained in the Thomery manner, each with two arms, which produce short bearing shoots, to fill that part of the wall which is under the sill of the parlour window, and between the bed-room windows and the roof. The other vines are all trained in Mr. Hoare's manner, each with two arms, and each arm producing only two shoots, viz., one for bearing, shown by wavy lines in the figure, and the other for producing wood, which is indicated by dotted lines. The length of the wavy lines may vary from five feet to ten feet; and there is no limit to the length of the main stems, but the height

2152



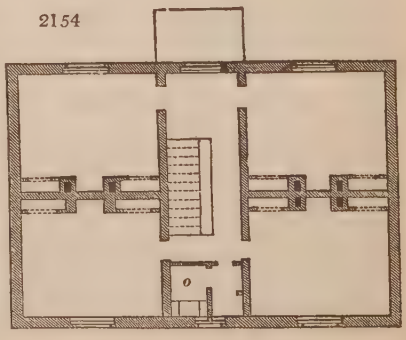
of the wall or house. The fruit trees, *h*, *l*, on the lower part of the wall may be apples, cherries, or plums, and those on the upper part pears.

2153



2357. *Accommodation.* The ground plan, fig. 2153., shows a porch, *a*; dining-room, sixteen feet by fourteen feet, *b*; library, fifteen feet by fifteen feet, *c*; drawingroom, of the same dimensions as the dining-room, *d*; water-closet, *e*; kitchen, *f*; pantry, *g*; back-kitchen, *h*; open court, *i*; conservatory, opening into the drawingroom, *k*; tea-room, three steps higher than the floor of the conservatory, *l*; propagating-house, *m*; and covered way to the garden and to the stoke-hole to the propagating-house *n*. The bed-room floor, fig. 2154., shows four good bed-rooms, each with two closets, and a water-closet, *o*.

2154



2358. *Remarks.* This design was made for a retired mercantile man, who has given himself up to the culture of his garden, in the open air during summer, and in his propagating-house during winter and early spring.

Design V.—*Annat Cottage, near Errol, Perthshire.* By Archibald Gorrie, Esq., F.H.S., &c.

The elevation is shown in the isometrical view, fig. 2157. ; the plan in fig. 2155., and the section on the line A B in fig. 2156.

2155

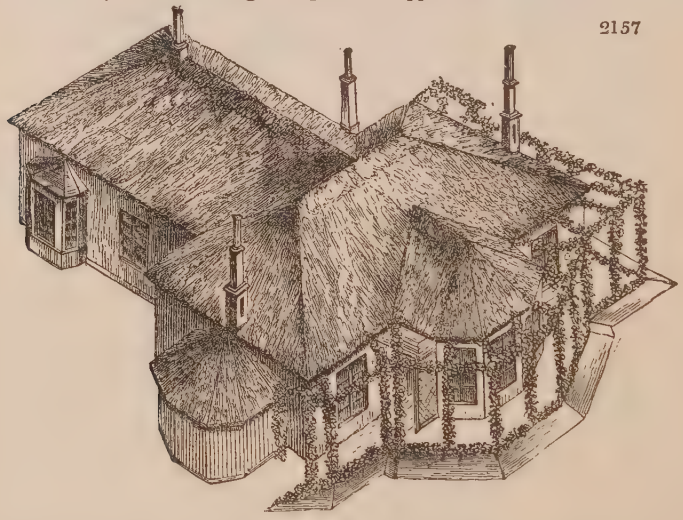
2359. *Accommodation.* The plan, fig. 2155., contains a lobby with flower-stage, *a*; sitting-room, *b*; stranger's bed-room, *c*; kitchen, *d*; writing-closet, *e*; lobby or passage, *f*; bed-room, *g*; pantry, *h*; greenhouse, *i*; place for fuel, *k*; raised terrace, with open veranda, on which roses may be trained as seen in the isometrical view, *l*.

2360. *Description.* Lofty trees surround the cottage on three sides, and I feared that this might cause the chimneys to smoke, to prevent which, on the plan of Dr. Dick of Broughtyferry, I caused the masons to contract the chimney flues about eighteen inches above the lower part of the lintel to about seven inches square, widening gradually to ten inches. This had the effect of promoting a draught, and keeping the rooms clear from smoke. The place for plants in the lobby is two feet and a half above the floor; it contains a small space in the centre for silver or gold fish. The pots are plunged in fine sand, removable at pleasure. Under this floor is ample room for cellarage. The terrace, suggested by several plans in your excellent work, is generally admired. I preferred reeds to slates, as more in character with the cottage and grounds. The veranda pillars are covered with Noisette and other roses, reaching over the terrace walk on cross rafters, three or four feet separate, to admit light. The cottage is happily

2156

situated, having a finely wooded background, with an extensive view of the rich vale of the Carse of Gowrie in front, and is generally reckoned a good thing of its kind. The artificial stone chimney-tops seem to stand the weather well, and, at a very cheap rate, add to the safety from fire by conveying the sparks to a considerable height above the reeds. They also, it is thought, improve the appearance of the roof. — *A. G.*

2157



2361. *Remarks.* We admire this design exceedingly, and we are informed by our friend, Robert Chambers, Esq., the editor of the most useful journal of the age, who has seen the interior, that the house is as comfortable within, as its exterior is picturesque. The terrace, the veranda, the plant-stage on the entrance lobby, and the greenhouse, heated from the room *c*, and doubtless looked into through a window over the fireplace, have a fine effect in elevating the character of the cottage, and bringing it within the regions of elegance and taste.

Design VI.—*A Cottage in the Old English Style.* By John Robertson, Esq., Architect.

The elevation is shown in fig 2160.; the ground plan in fig. 2158., and the bed-room floor in fig. 2159.

2362. *Description.* This cottage is about to be built in Berkshire, for a gentleman with a small family. The ground to be attached to it is chiefly level throughout, with the exception of a raised bank near the adjoining property, which would have been the best site for the intended building; but the proprietor objected to this situation, lest at a future period his neighbour should erect any thing near the cottage that might give annoyance, or appear disagreeable. It was not likely that this would be the case; but its bare possibility led the proprietor and architect to adopt a situation at the opposite extremity of the ground, near the public road. The first object in choosing this latter site

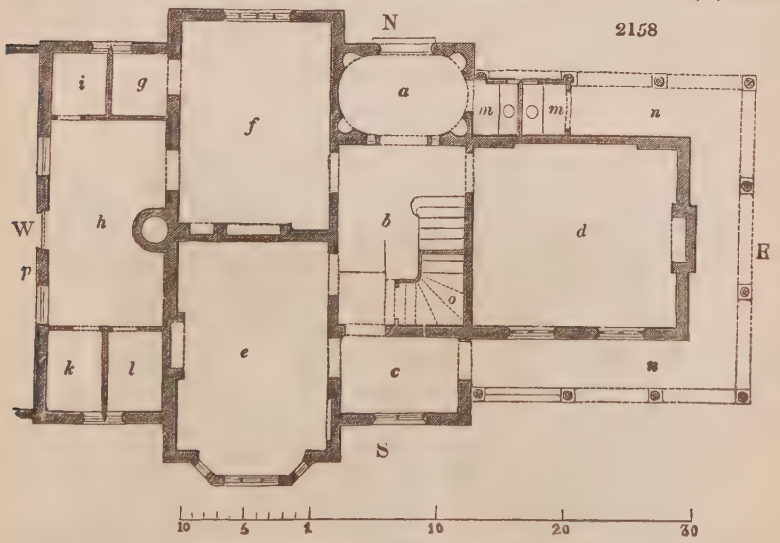
was to select the highest and driest spot, and that whence the most extensive and best view could be obtained from the windows, as well as to secure the greatest seeming extent of pleasure-gardens when the ground should be properly laid out.

The entrance-porch was originally in the garden front, in the situation of the ante-room, fig. 2158., and the approach swept round the east end of the building from the public road behind; but here again the proprietor suggested that, while the chief front was to the south, and consequently facing the pleasure-grounds, he should like the entrance-porch to be behind, or to the north; as it would, he thought, give the family, in his absence, a feeling of greater security in so lonely a spot, by having the entrance to the public road. The plan was, therefore, altered to suit these views, and is here presented in its amended form.

The building is to stand about fifteen or sixteen yards from the road, and is to be approached by a covered way to the entrance, from which no view will be had on either side. This arrangement is intended to carry out the idea, that however ill chosen or unsatisfactory the situation may appear to a visitor on his first entrance, yet, when taken to the sitting-room windows, or to the lawn in front, he would be rather surprised, and ready to give up his first impressions as to the inapropriateness of the site.

The family at present being small, the two servants kept are to occupy one of the up-stairs bed-rooms; but should the family become larger, it is intended to raise the wing containing the wash-house, &c., and make two bed-rooms over for the servants.

2363. *Accommodation.* Fig. 2158. is the ground plan, in which *q* is the entrance-porch, which is to be finished with a coved roof, and to have Gothic niches in the angles for statues, &c. From this we pass to the hall and staircase, *b*, by a Venetian door, the upper part of which is glazed with stained glass; thence to a small ante-room, *c*, from



which there is a door to the covered terrace, *n*. From the hall we enter the dining-room, *d*, the two windows of which are to be brought down to the floor, and to open like French casements, so as to admit of easy access to the terrace when the ante-room is occupied. From the hall we likewise enter the drawingroom, *e*, which has a door to the ante-room; also the kitchen, *f*. The kitchen-door from the hall is finished on the staircase side in the same manner as the doors of the principal rooms. This door will only be occasionally used as an entrance from the porch to the kitchen, as there is a back entrance through the yard and wash-house for servants, &c. From the kitchen there is a coal-closet, *g*; back-kitchen or wash-house, with copper, *h*; place for cleaning knives, &c., *i*; larder, *k*; store-closet or pantry, *l*. There are two water-closets, *m m*, both under cover, one entering from the porch, and the other from the terrace. Under the principal stairs is a flight of steps, *o*, shut in by a door, descending to the wine and beer cellars, &c., which are underneath the dining-room and terrace, and are lighted from grated openings in the paved flooring of the latter. Behind the wash-house, at *p*, there is a kitchen-yard hid by shrubbery in front, which contains the undressed meat larder, coal shed, wood-house, privy, well, drying-ground, &c.

2159

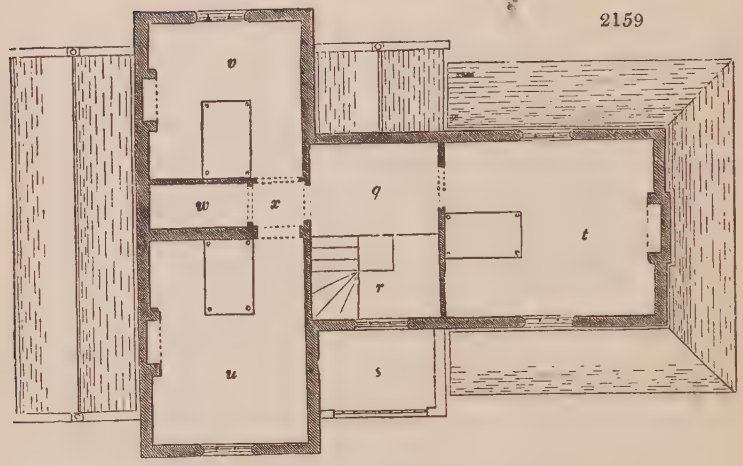


Fig. 2159. is the plan of the chamber floor, in which *q* and *r* show the landing and stairs; *s*, balcony over ante-room, entered from the staircase window; *t*, principal bed-room; *u*, second bed-room; *v*, third bed-room; *w*, linen-closet; *x*, lobby.

Fig. 2160. is a perspective view of the south and east fronts.

2160

A few other apartments and conveniences might have been introduced in this design, did the amount to be expended and the size of the family warrant it, but this not being the case, the architect's endeavour was to make the most of the means allowed him, and to produce a comfortable little habitation for a gentleman of limited income. His instructions were, to design "a neat cottage in a Gothic style, with a covered terrace, that should contain two sitting-rooms and three bed-rooms, with other conveniences, and the estimate not to exceed from £650 to £700." How far he has succeeded he leaves the reader to judge.

2364. *Specification.* The foundations are to be eighteen inches thick, with proper footings, and the walls carried up of fourteen-inch brickwork; the best grey stocks to be used externally, and to be picked of a uniform colour for the fronts, and finished with a neat straight joint. The openings all round, and chimneys, to be faced with

cement in imitation of stone. The roof of the terrace to be supported by rustic limbs of trees, having the bark left on, and placed on stone plinths, with wooden caps, frieze, and cornice. The pendants and finials to gables to be of oak, and the verges to be finished with moulded boards, and ornamental hangings, of 1½-inch well seasoned deal, painted in imitation of oak. The bow window to be finished above the level of the sills with wood painted in imitation of oak, and covered with lead. The roofs to be covered with countess slates laid on ⅝-inch deal boarding, with proper lead flashings to chimney-shafts. The ridges and valleys to be covered with lead. The windows to be splayed and finished with mullions and transoms, as shown by the drawings. The balcony to have an ornamental iron railing in front. The flues to be ten inches by twelve inches, except that of the kitchen, which is to be twelve inches by fourteen inches. The terrace wall, above the surface, to be bounded by a stone plinth, and the door steps and steps from the terrace to the garden to be of York stone. The bearing timbers to be of the best Dantzic or Memel fir, with oak sleepers for the ground floor, and oak lintels over the openings, &c. The windows to be glazed with the best second crown glass.

The interior to be finished with the best well seasoned yellow deal, in a plain but substantial manner, and all the door panels, mouldings, room cornices, chimney-pieces, and other finishing, characteristic of style, to be of a Gothic description. The stairs to have an ornamental Gothic railing or balustrade, and boarded in from the string to the floor. The upper part of the door from the hall to the ante-room to be glazed with stained glass. The whole of the woodwork, externally, to be painted in imitation of oak.

2365. *Estimate,* including the out-offices, &c., about £670.

Design VII.—*A small Roman Villa.* By E. B. Lamb, Esq., F.I.B.A.

An elevation of the garden front is shown in fig. 2161., and fig. 2162. shows the ground plan.

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2366. *The Accommodation* which the latter contains is, an entrance hall, *a*; drawing-room, *b*; library, *c*; dining-room, *d*; passage to the kitchen and stairs to the bed-rooms and cellars, *e*; kitchen, *f*; back-kitchen, *g*; pantry, *h*; conservatory, *i*; and terrace and stairs on the lawn front, *k*. On the floor above are three good bed-rooms and a servant's bed-room; and on the cellar floor there are a dairy, larder, and other conveniences required for servants' use.

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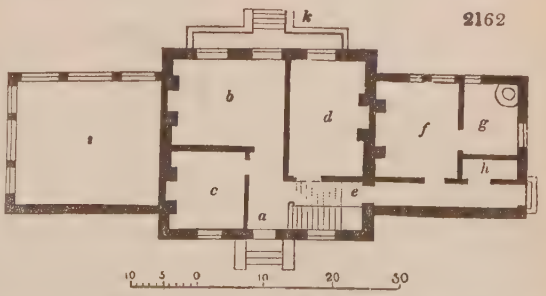

2367. *Remarks.* This casino was designed for a citizen, chiefly for the purpose of occasional retirement. During the greater part of the week, the only occupants will be the gardener and his wife. There is a stable, coach-house, and other offices, at a short distance; and the whole is surrounded by a lawn, enclosed by a shrubbery, in which the height of the plants, and especially of the evergreens, is calculated to exclude other houses or buildings, and admit, as much as possible, such verdant scenery as is characteristic of the country. Over the fireplaces in *b* and *c* there are windows into the conservatory, each of which consists of one plate of glass, without bars. There is no communication between the rooms and the conservatory by doors, a prejudice existing in the family against the moist air essential to healthy and vigorous vegetation.

Design VIII.—*A Roman Villa, designed for a particular Situation.* By E. B. Lamb, Esq., F.I.B.A.

The front elevation is shown in fig. 2163. This villa was designed by Mr. Lamb for one of those beautiful knolls which occur on the Dover road, between Dartford and Canterbury. Like the preceding design, it was made at the desire of a wealthy citizen, chiefly for the purpose of enabling him to display his wealth and taste to his

2163

friends on holidays. Hence, as it will be observed in the plan, fig. 2164., all the rooms are arranged for the purpose of display, and the whole building is surrounded by an elevated paved terrace, which commands, on every side, the scenery of one of the richest and best of England's counties, and her noblest river.

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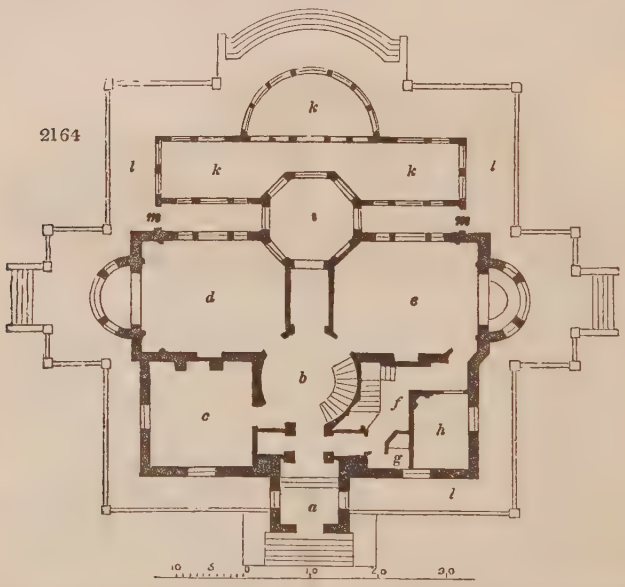


2368. *The Accommodation* contained in the principal floor consists of an entrance-porch, *a*; lobby, hall, and staircase, *b*; library, *c*; drawingroom, *d*; dining-room, *e*; back-stairs, *f*; water-closet, *g*; dressing-room for day visitors, *h*; statuary room, *i*; conservatory, *k k k*; and terrace, *l*. There is a passage between the conservatory and the house, which is shut up at the ends so as to form an aviary, and the birds can be admitted to the conservatory, the drawingroom, the dining-room, and the sculpture room at pleasure.

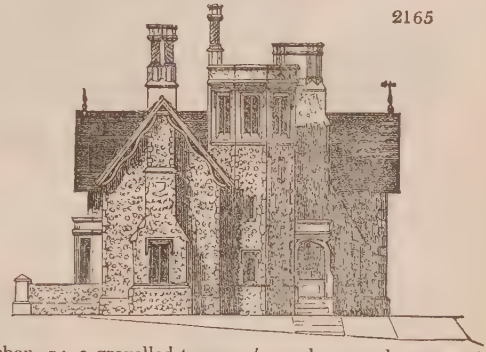
2369. *Remarks.* The windows to the offices have each small sunk areas, taken from the terrace, and covered with iron grating. These windows, though not seen in the elevation, being concealed by the terrace parapet, yet reach nearly three feet above the level of the terrace, so that there is abundance of light to all the lower apartments. By closing the doors at the ends of the covered passage *m m*, and taking out the conservatory windows on that side, the width of the conservatory may be increased at pleasure; and by taking out the windows of the dining-room and drawingroom, the conservatory

may be united to them, so as to have the appearance of the whole being only one apartment, or, rather, one Oriental garden. In the centre of the aviary there may be a fountain; and in the sculpture saloon there ought only to be one group of statues in the centre, and one statue against each of the eight piers between the windows, in order not to interrupt the view of the conservatory and the fountain from the saloon and the two principal rooms. The conservatory is heated by hot water, from the sunk story.

Designs IX. to XII.—*Small Villas in the Gothic Style.* By E. B. Lamb, Esq.

These villas are some out of a number that were designed by Mr. Lamb for a gentleman who had taken an extensive tract of land in Kent, not far from Gravesend, on a building speculation. As it ultimately failed, none of them were erected, except one, which, with some variations, was built by a gentleman in the neighbourhood.

2165



2370. Design IX. is shown in elevation in fig 2165.; and the plan, fig. 2166., contains on the principal floor an entrance-porch, *a*; staircase, *b*; lobby, *c*; drawingroom, *d*; dining-room, communicating with the drawingroom by folding doors, *e*; kitchen, *f*; back-kitchen, *g*; a gravelled terrace, *h*; and a paved terrace, *i*.

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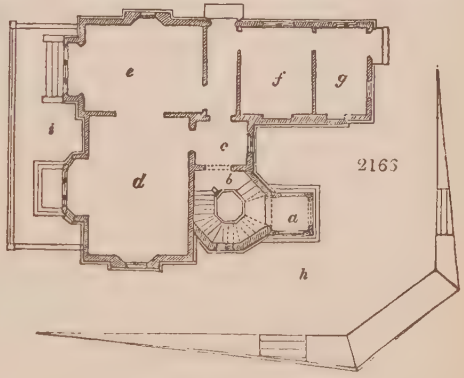

2371. *Remarks.* The arrangement is good. The passage between the kitchen and the dining-room affords a convenient way out to the kitchen-garden, and there is a door in the back-kitchen which communicates with a small kitchen court not shown in the plan. The elevation is picturesque, and though the situation of the barge-board may be objected to by the rigid followers of Pugin, yet what is to be done in a case like this, where the roof projects as much as the chimney?

2372. Design X. is shown in elevation in fig. 2167.; and

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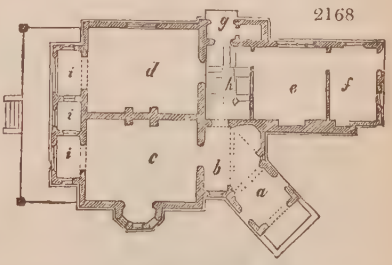
2168



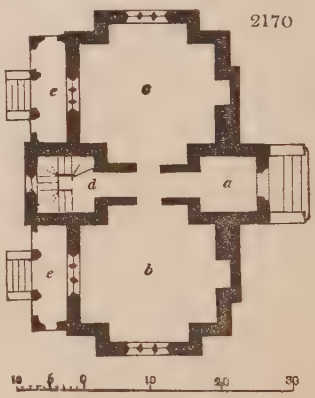
the plan, fig. 2168., contains an entrance-porch, *a*; lobby, *b*; dining-room, *c*; drawing-room, *d*; kitchen, *e*; back-kitchen, *f*; water-closet, with door to the kitchen-garden, *g*; stair to bed-rooms, *h*; plant cabinets, *i i i*; and paved terrace, with steps to the lawn, *k*.

2373. *Remarks.* The recesses, *i i i*, are intended as plant cabinets, with long roofs, the windows of the room forming ornamental Gothic screens glazed with long strips of glass. If these cabinets are separated from the rooms by sliding sashes, they may be taken away in summer, and the space added to the room.

2169

2374. Design XI. is shown in elevation in fig. 2169.; and the plan, fig. 2170., contains an entrance porch, *a*; dining-room, *b*; drawingroom, *c*; stair down to kitchens and up to bed-rooms, *d*; and glazed verandas, open in front in summer, and closed by glass in winter, *e*, *e*.

2170



2375. *Remarks.* There is something grand in this elevation, from the prevalence of vertical masses, and the small proportion of wall pierced with doors or windows, as compared with the solid part. Add also, that both in the plan and elevation the walls appear thicker than usual. The design might crown the summit of one of those low hills which often advance into the plain from the lower part of ranges of mountains; such hills, sometimes rocky, sometimes smooth, are frequently met with in the north of Scotland. The unusual thickness of the walls is required in consequence of their being of rubble. The quoins are of scappled stone, and the mouldings and other dressings worked smooth or finely tooled. The whole of the woodwork throughout the house might be of larch, and, where it is used for doors, &c., it should be either oiled or varnished; painting would be quite unnecessary. The approach will be obtained of a very gradual ascent, so as to display the house in connexion with the scenery, in a variety of combinations.

2376. Design XII. is shown in elevation in fig. 2171.; and the plan, fig. 2172., con

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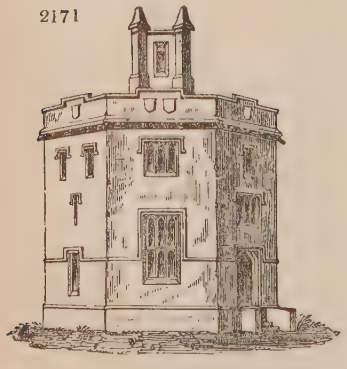

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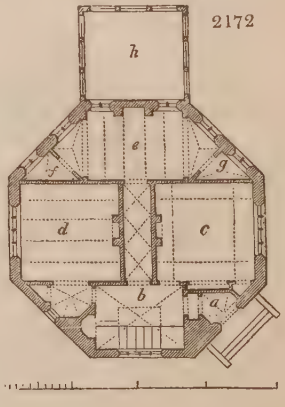
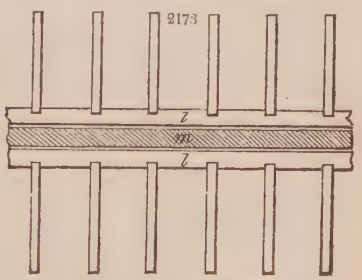


tains an entrance-porch, *a*; hall and staircase, *b*; dining-room, *c*; drawingroom, *d*; library, *e*; reading-closets, *f*, *g*; and conservatory, *h*. The dotted lines show the manner in which the ceilings of these rooms are to be finished.

2377. *Remarks.* This design is chiefly to be valued for the ingenious manner in which the space is disposed of. Like the last design, it seems peculiarly adapted for crowning an eminence.

Design XIII.—*Sir John Robison's House, Randolph Crescent, Edinburgh.* By John Milne, Esq., Architect.

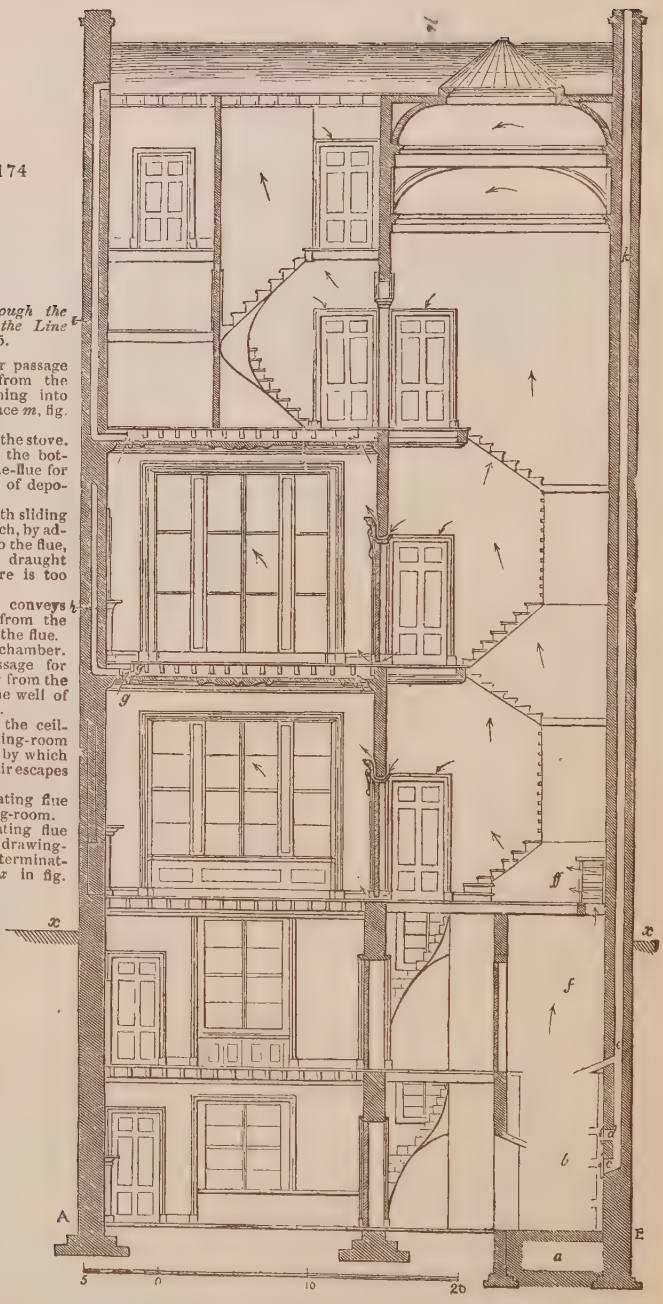
2378. *Sir John Robison's House, Randolph Crescent, Edinburgh.* This house is given as an example of the most perfect application of the system of heating with hot air that we have any where met with, except in the houses of the inventor, W. Strutt, Esq., and his friends in the neighbourhood of Derby. This house is also equally perfect in every other respect; and, in short, it is allowed to be the most complete street dwelling in Edinburgh. It is a first class house, forming one of a crescent built on a very steep bank on the river Leith, presenting three stories to the street, and six stories to the river, on the sloping side behind. There are small gardens on the slope, and a sunk area of two stories next the street. The following account was drawn up by John Milne, Esq., architect, Edinburgh, in November, 1839; and we had ourselves an opportunity of examining every part of the house in September, 1841, and found it exactly as described by our correspondent. "Pursuant to your instructions, I applied to Sir John Robison for the loan of the working-plans of his dwelling-house here, and for leave to view and examine the house itself. Having obtained free access, and every information I required, I have been enabled to make out the accompanying sections and relative details, figs. 2173. to 2184. In describing these, I shall confine myself to such points in the construction or arrangement as appear to be improvements on the usual routine followed in the laying out and fitting up of street houses of this class. The distribution of the space is so managed, that, with the exception of two partitions in the first chamber floor, which cross the floors without resting on them, all the internal walls reach from the foundation to the roof. The two partitions above mentioned are likewise of stone, and are supported in a manner which insures their permanent stability. The walls forming these partitions stand on cast-iron beams, isolated from the floors, the joists of which are supported by wooden beams placed alongside, but not connected with the iron beams, as shown in fig. 2173., in which *m* is the cast-iron beam. The movements of the flooring, therefore, are not communicated to the partitions, which, not being subject to vibration, remain secure. By this construction, also, the spreading of fire must be impeded and danger lessened, as it affords the means of continuing a stone staircase to the attic chambers; see section, fig. 2174., and section, fig. 2177., at the chamber floor.



l, Wooden beams for supporting the floor.
m, Isolated cast-iron beam for supporting the brick partition.

2379. *The System of Ventilation* employed in this house appears to be as perfect as can be desired; as, while the mass of air in the rooms and passages is constantly undergoing renewal by the escape of the vitiated air above, and the admission of large supplies of fresh air from below, no currents are perceived in the apartments, which, even when crowded with company and amply lighted, preserve a remarkable freshness of atmosphere. The sectional area of the cold-air passages is equal to nearly fourteen square feet; in calm weather, however cold the season, both passages are quite open. This is effected by means of cylindrical flues of earthenware, nine inches in diameter, built into the gables, in close proximity to the smoke flues of each room. The lower ends of these ventilating flues open into the spaces between the ceilings of the respective rooms and the floors of those above them; and there is one or more of these exit air-flues in each room, according to its size and use. The heated and vitiated vapours pass upwards through the ceilings by a continuous opening of about one inch and a half wide (behind one of the fillets of the cornice) all round the rooms, and having thus passed into the space between the ceiling and the floor immediately above, they ascend by the flues in the wall, and are discharged by them into the vacant space between the ceilings of the attics and the roof; from whence they find their way through the slates to the open air. The passage for the air through the cornice is not visible from the floor of any of the rooms, as you will see in section, figs. 2174. and 2177., and on a larger scale in fig. 2178. The air-flues are made to terminate above the ceilings of

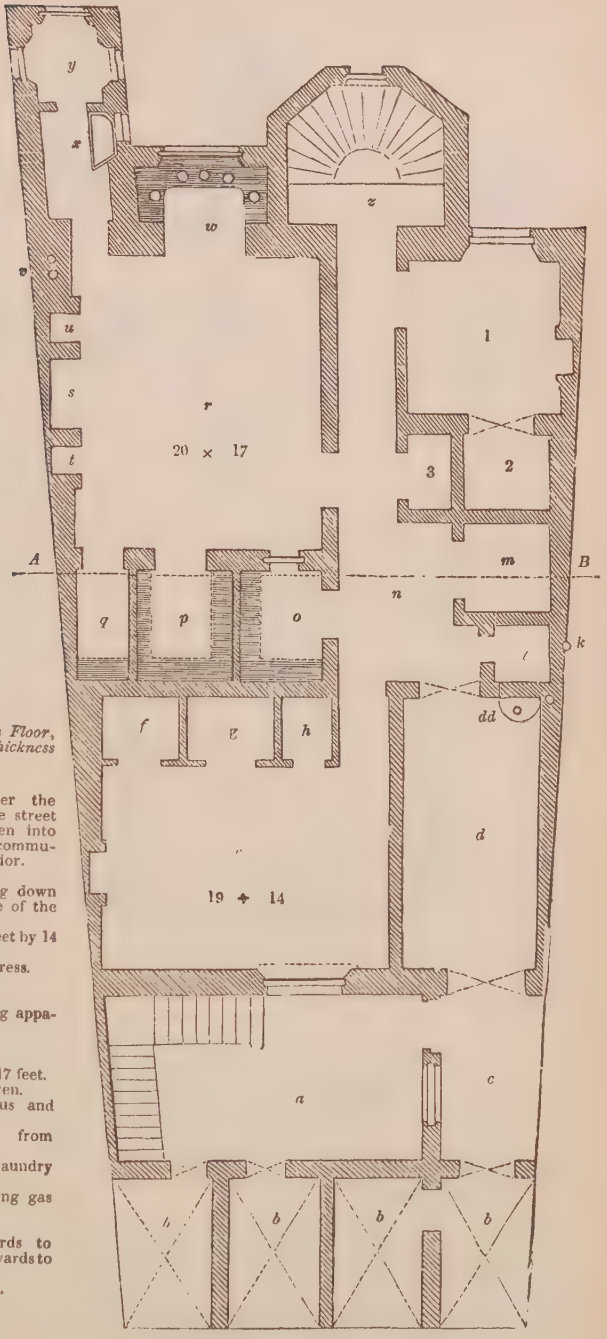
2174



Section through the Building on the Line A B *in fig.* 2175.

a, The cold-air passage or tunnel from the garden opening into the stove place *m*, fig. 2175.
b, Situation of the stove.
c, Opening to the bottom of smoke-flue for the removal of deposited soot.
d, Opening, with sliding damper, which, by admitting air to the flue, checks the draught when the fire is too strong.
e, Pipe which conveys the smoke from the furnace into the flue.
f, Warm air chamber. *ff*, exit passage for the warm air from the stove into the well of the staircase.
g, Opening in the ceiling of the dining-room all round it, by which the vitiated air escapes into
h, The ventilating flue for the dining-room.
i, The ventilating flue for back drawing-room; both terminating as at *xx* in fig. 2177.

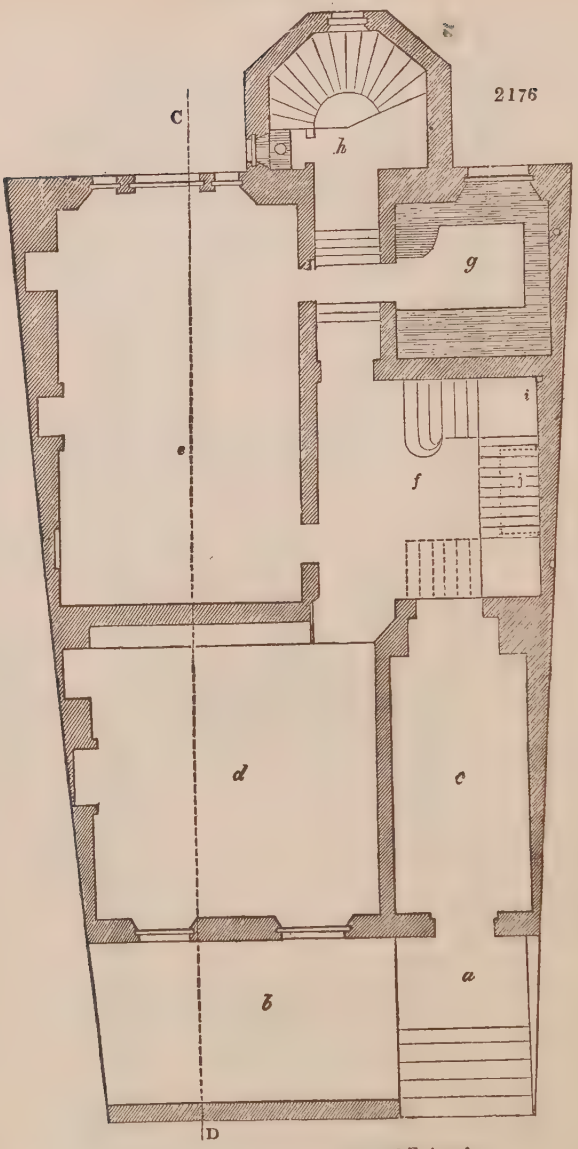
the attics, and below the roof of the house, rather than at the chimney heads, in order to prevent the possibility of smoke being ever brought down by reverse currents; and an advantage is likewise gained in protecting the attic story from the cold which would otherwise be communicated from the roof during winter The



Plan of the Kitchen Floor, showing only half the thickness of each gable.

a, Sunk area.
b b b b, Cellars under the foot-pavement of the street in front. Two open into the area, the others communicate with the interior.
c, *d*, Outer passages.
dd, Trap for shooting down coals for the service of the furnace.
e, Servants' hall, 19 feet by 14 feet.
f, *g*, *h*, Bed-places and press.
i, Press.
k, Flue of furnace.
m, Situation of heating apparatus.
n, Inner lobby.
o, *p*, *q*, Presses.
r, Kitchen, 20 feet by 17 feet.
s, *t*, Open grate and oven.
u, Steaming apparatus and hot closet.
v, Ventilating flue from kitchen ceiling.
vv, Smoke flue from laundry below the kitchen.
w, Projection containing gas cooking stoves.
x, *y*, Scullery, &c.
z, Staircase downwards to ground floor, and upwards to dining-room floor.
1, Housekeeper's room.
2, Bed alcove.
3, Press in passage.

continued supply of fresh air to the lower part of the house, to replace that which goes off by the ventilators and by the chimneys, is brought in from the garden [illegible]

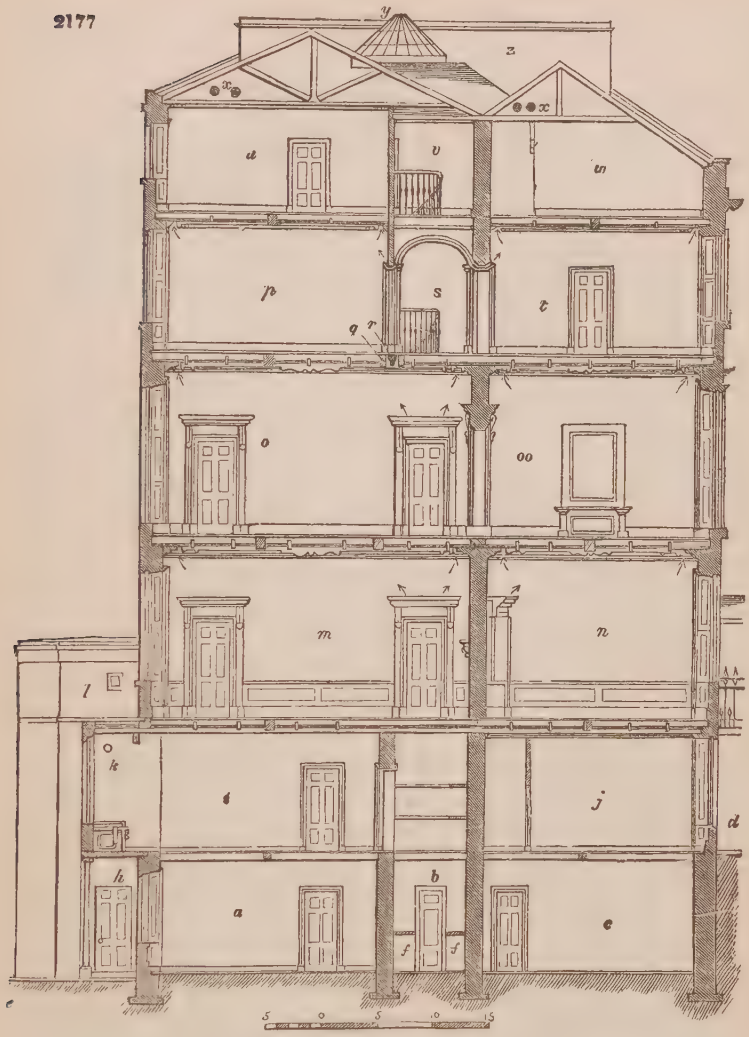


Plan of the Dining-room Floor and Entresol.

a, Street door. *b*, Sunk area.
c, Hall, 19 feet by 10 feet.
d, Parlour, 19 feet 6 inches by 19 feet.
e, Dining-room, 27 feet by 18 feet.
f, Well of main staircase, 16 feet by 15 feet.
g, Butler's pantry in entresol.
h, Stair to kitchen, from the landing in which is seen a water-closet.
i, Covered raglet (groove) in wall of staircase, in which the water service-pipe is situated.
j, Dotted lines showing the opening by which the warmed air enters the staircase under the stair.

the house by a passage, the sectional area of which is eight superficial feet. The cold air admitted by this passage (or by another similar one from the front of the house) is made to pass over a stove in the chamber *b*, in fig. 2174., on the principle of the late William Strutt, Esq., of Derby, which has a surface of nearly ninety feet, by which means

2177



Section of the Building on the Line C D *in fig.* 2176.

a, Laundry. *b*, Wine-cellar. *c*, Stove-room. *d*, Entrance from area to kitchen floor. *h*, Door to garden. *e*, Steps to garden. *f f*, Bins of wine-cellar. *i*, Kitchen. *k*, Ventilating flue from cooking-stoves. *l*, Exterior of staircase to the lower floors. *m*, Dining-room. *n*, Parlour. *o*, Back drawingroom. *oo*, Front drawingroom. *p*, Chamber. *q*, Beam carrying the joisting. *r*, Iron beam carrying brick partition and attic stairs. *s*, Attic staircase. *t*, Chamber. *v*, Passage to rooms on attic floor. *w*, Attic chamber. *x x*, Openings of ventilating flues over the ceilings of attics. *y*, Cupola lighting the principal staircase. *z*, Chimney-heads.

a temperature varying from 64° to 70° of Fahrenheit is communicated to it. In very cold weather 70° is occasionally given to compensate the cooling effect of the walls and glass windows, so as to keep up the temperature at 60° throughout the house; but the usual temperature of the air issuing from the stove is as low as 64°. The whole of this air is discharged into the well of the staircase, which forms a reservoir from which the rooms draw the quantity required to maintain the upward currents in the chimneys and in the ventilating flues. The air in the staircase finds its way into the apartments by masked passages, of four or five inches wide and four feet long, over the doors, and by openings left under each door of about one inch wide. The sectional areas of these passages are more than equal to the areas of the chimney and ventilating flues; there is,

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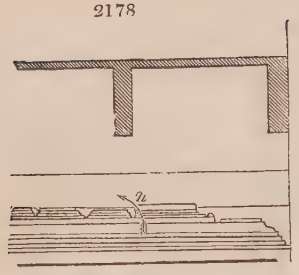
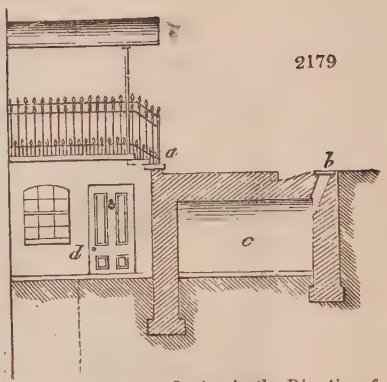


Section of Part of the Ceiling and Floor over.

The object of this section is to show the manner in which the air passes into the vacuity between them by means of concealed openings at *n*, which are also shown at *g* in fig. 2174.

2179



Continuation of the Section in the Direction of C D in fig. 2176.

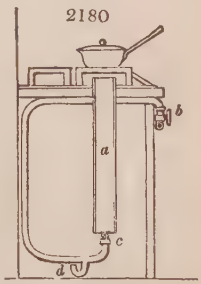
a, Main entrance under an open porch. *b*, Opening in the side of the street for shooting down coals, with a cast-iron cover. *c*, Coal-cellar. *d*, Door and window to the passage marked *c* in fig. 2175.

therefore, no rarefaction of the air within the rooms, nor any tendency of the external air to enter at chinks of windows, or other irregular apertures. The course of the air, from the great aperture over the stove, through the staircase, over and under the doors, into the rooms, and thence through the ceilings and upwards by the escape-flues, is shown throughout both sections by the direction of the arrows; and the quantity of escape is regulated by hand by means of throttle-valves at the mouth of each escape-flue: hence, by opening or shutting these throttle-valves, the rate of the ventilating current is augmented or diminished. In consequence of the peculiar situation of this house, on the steep slope of the bank of the river Leith, there are two complete stories below the level of the entrance from the street. This gives great advantage in the employment of Mr. Strutt's stove, for producing the temperature required to be given to the air so freely distributed in the upper parts of the building. Circumstances might render this less easy in a house differently situated, and in some cases it may be necessary to have recourse to hot-water pipes or other known methods of communicating heat; but, whatever means of heating may be employed, a proper system of ventilation requires that the supply of fresh air should be large, and that the temperature of it at its issue from the stove be not higher than 70° of Fahr. In houses where the supply of external air is more limited, and where a higher temperature is communicated to it by the heating apparatus, its salubrity is always more or less impaired, as, even at a temperature far below that of boiling water or of steam pipes, the air of towns begins to give out unpleasant effluvia from the animal and organic matters held in suspension in it; and when a high temperature has been attained, air becomes so absorbent of moisture, that it acts unfavourably on the lungs of those by whom it is breathed. Again, when a heating apparatus of small extent of surface is used, and a small supply of external air is admitted, this air is usually raised to a high temperature; and, as a sufficient supply of air must necessarily get in somewhere else, to enable the chimneys of the house to draw, the hot air coming from the stove is speedily diluted by the cold air entering furtively. The same temperature may be partially produced as in the arrangement above described; but the unequal distribution of the hot and cold currents causes discomfort in some parts, while the over-heating of the portion which passes the stove renders it less salubrious, and sometimes offensive. It is imagined by many that air is not vitiated by artificial heat when under 100° of Fahr.; but this is a mistake, as, besides the ill effects arising from its too great avidity for moisture, a heat considerably less than this is sufficient to extricate effluvia from it, as has been already observed: hence, a copious supply of air at a moderate temperature is more agreeable and more conducive to health than an atmosphere of the same temperature formed by a mixture of cold and over-heated air. [On the occasion of our visit to Edinburgh, in September last, we took the opportunity of enquiring whether experience had suggested any alterations or improvements in these arrangements. Sir John Robison's reply was, that, if the house were to be built again, the only difference he should make would be to form the air-passages still wider.]

2380. *The Kitchen* is ventilated on the same principle as the rooms above stairs. One flue proceeds from the ceiling over the fireplace, and another from over the gas cooking

stoves, seen in section fig. 2177., and also in fig. 2180. The first flue is built in the gable, close to the smoke-flue; and the second passes upwards by the back of the cistern and pipes of a water-closet, defending them from the action of frost in winter. The gas cooking stoves are of the form which you have already described (p. 690.). They are eight in number, the mouth of each being four inches in diameter, a size which experience has shown to be the most useful. An improvement has lately been introduced in these stoves, which consists in spreading a layer of fine gravel, or coarse sand, of half an inch thick on the wire gauze tops. This completely protects them from oxidation and over-heating, yet does not interfere with the free passage of the current of mixed gas and air. The kitchen fireplace is no larger than is requisite for roasting; all the other processes being performed either in the oven, the steam vessels, or on the gas stoves. These stoves are placed in the bay of a large window, giving the cook the advantage of a good light above the level of the pans. A close boiler at the back of the grate affords steam for the cooking vessels, and for a hot closet. This boiler also contains a coil of iron tubing, through which the water of a bath, placed in a dressing-room in the chamber floor, is made to circulate when a hot bath is wanted.

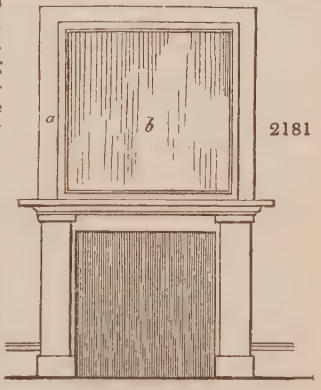
2180



Section through Gas cooking Stove Table.

a, Tube of sheet iron, thirty inches long by four inches' diameter, open at the bottom and covered at top by wire gauze, through which the gas, mixed with common air, passes before it is inflamed.
b, Gas-pipe and regulating stop-cock.
d, Siphon, forming a water-joint to allow of the escape of condensed water.
c, Nozzle of gas-pipe, admitting gas to mix and rise with the air in *a*.

2381. *The House is lighted by Gas* in every part; but no offensive vapour nor inconvenience of any kind appears ever to be felt from it. The distribution pipes are of greater diameter than are generally employed, and the pressure or current thereby so equalised, that no sinkings or flutterings of the flame are caused by the opening and shutting of doors. The forms and proportions of the Argand burners and glass chimneys are also so arranged as to effect nearly a maximum development of light (of an agreeable hue) from the gas, and to prevent any disengagement of sooty vapour; that this last object has been obtained, the perfect purity of tint of the white and gold ceilings in the drawingrooms is a satisfactory proof. The mirrors over the chimneys have statuary marble frames, as shown in fig. 2181., and each chimney-piece has two gas-lights. The convenience and economy of gas light being undeniable, it is important to know that in certain circumstances, of easy attainment, it may be rendered as elegant and agreeable a light as any that can be produced from more expensive materials. A paper on the subject of the best mode of employing gas for illumination, by Sir J. Robison, appeared in *Jameson's Journal*, and in the *Mechanic's Magazine*, in 1839 and 1840.



2181

Drawingroom Fireplace.

a, Flat marble frame, similar in quality to the marble jambs, with a narrow border moulding.
b, Mirror.

2382. *In the Distribution of Water* through the house, the pipes and cisterns are, as far as possible, placed out of the reach of frost. Instead of the ball-cocks usually placed in cisterns, an apparatus represented on an enlarged scale in figs. 2183. and 2184. is used. It has the advantage of not being subject to wear or to leak, and is not liable to cease to act from becoming stiff.

2383. *Chimney-flues.* As before mentioned (§ 2379.), the chimney-flues for carrying off heated vapours from the ceilings are made of cylinders of red earthenware, of eight or nine inches' diameter; those by which the smoke of the fires is carried away are cylinders of fire-brick clay from two to three inches thick, according to their diameters, which vary from ten to seven inches according to the size of the fireplace they belong to. In each fireplace, where the throat of the chimney is gathered together over the grate, there is a valve made of rolled iron plate, which fits into a cast-iron seat fixed in the brickwork: when this valve is in its seat neither soot nor back smoke can pass; and when it is thrown back the passage to the flue is unobstructed. (See fig. 2182)

2384. *Escape of melted Snow.* There is a provision for the free escape of melted snow from the roof, which, I am informed, has been copied from the Derby Infirmary. It

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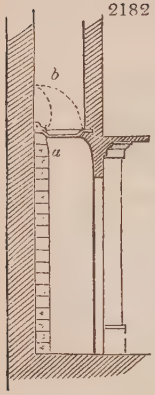


Section of the Throat of a Chimney.

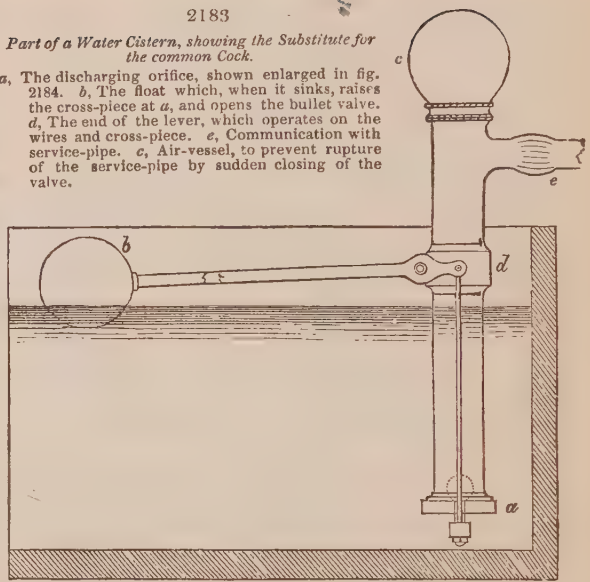
a, The valve-seat and valve when shut.

b, The valve when open. A short chain hangs from the under side of the valve, by which it is pulled down to the seat.

2183

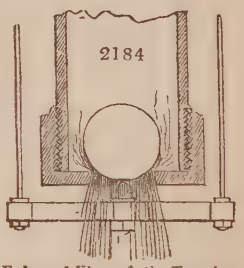
Part of a Water Cistern, showing the Substitute for the common Cock.

a, The discharging orifice, shown enlarged in fig. 2184. *b*, The float which, when it sinks, raises the cross-piece at *a*, and opens the bullet valve. *d*, The end of the lever, which operates on the wires and cross-piece. *e*, Communication with service-pipe. *c*, Air-vessel, to prevent rupture of the service-pipe by sudden closing of the valve.



seems so simple and obvious that it may be wondered why it is not universally adopted. It consists in covering all the gutters and the openings of the vertical pipes with thin boards laid on cross bearers. When snow falls, it lies on these boards and leaves a clear passage underneath, by which, when a sudden thaw takes place, the water runs freely away, instead of being impeded by a mass of half-melted snow, which would otherwise choke up the passages, and might cause an overflow to penetrate the boards on which the slates are laid, and to do damage to the ceilings and walls below.

2184



Enlarged View of the Termination of the Discharge Pipe at a, in fig. 2183.

2385. *The Ironmongery.* Among the excellent articles of ironmongery used in fitting up this house, I may notice the mortise-locks on the doors of all the rooms, as they have the advantage of being let into the doors without weakening them, the latch being contained in a brass tube seven eighths of an inch in diameter and eight inches long, and requiring only a hole of an inch diameter for its reception. The latch is pressed out by a helical wire spring lodged within the tube; the action of the knob against this spring is particularly agreeable to the hand, as there is no sensible friction. The doors are locked or bolted by a small bolt which fixes the latch bolt. The two-way door-springs on the doors in the lobby and passages are also remarkably good (made by Beattie, Canal Street, Edinburgh); they retain the doors in their middle position with sufficient firmness to prevent them from yielding to the ordinary pressure of the wind, on an external door being opened; yet they do not oppose an increasing resistance when pushed either way towards the wall, and therefore offer no difficulty to servants when passing through them with both hands occupied in carrying any thing. The locks were furnished by W. and P. Steele, George Street, Edinburgh, and the door-springs by J. Beattie, Canal Street, Edinburgh.

2386. *The Joiners' Work.* As provision is made in the construction of the house for an abundant supply of external air to maintain the necessary upward currents in all the chimneys and ventilating flues, care has been taken to prevent the access of air by irregular entrances. The window frames are very carefully fitted; and of the French sashes on the drawingroom floor, one leaf only in each room is made to open. In the usual way in which French sashes are constructed, it is nearly impossible to make them weather-tight, as, when pressed by the wind they yield sufficiently at the joints to allow of rain being blown in. To prevent this here the leaf opens outward; and its frame being beveled, the joint becomes the closer the more pressure it sustains from the wind.

2387. I shall conclude these details by mentioning the way in which the drawing-room suite of rooms has been painted, as it appears to me to be new, to produce a good effect, and to be very durable. The walls have been prepared with several coats of white lead grained to imitate Morocco leather; on this a pattern of gilded rosettes has been laid, and the whole varnished with copal (including the gilding). Another pattern has then been superadded in flat white. The result gives the appearance of a lace dress over satin and spangles, which harmonises with the doors, cornices, &c., which are painted in flat white, with gilt mouldings.—*J. M. Princes Street, Edinburgh.*"

2388. *The Painting and Papering* were executed under the direction of that eminent decorator Mr. Hay, whose scientific work on the subject of his profession, *The Laws of harmonious Colouring*, we have frequently referred to in the body of this work. On applying to Mr. Hay, he sent us the following particulars: — "There was nothing very much out of my usual practice in the painting done in Sir John Robison's house in Randolph Crescent, except the walls of the drawingrooms and staircase. The bedrooms were done in the usual way; namely, ceilings sized on two coats of oil paint; walls papered with a white, embossed, satined ground paper, with small brown sprigs, and the woodwork painted white, and finished with copal varnish. The dining-room and Sir John's own room were both done in imitation of wainscot, with white ceilings varnished. The staircase ceilings and cornices, painted white and flatted; and the walls and woodwork painted also white, and varnished with copal. The drawingrooms and ante-room were all painted white; the ceilings and cornices, as well as the woodwork, being finished flat, and heightened with gilding. The walls are, as I have already said, rather peculiar in their style of painting, The groundwork is rendered regularly uneven by being granulated, by working it over with the point of a dry brush, immediately after applying the two last coats of paint. This is partly varnished and partly flat, the flat parts forming large rosettes. Between these rosettes, are smaller ones gilded; not in the base metal used upon paper hangings, but in sterling gold leaf. This style of decorative painting, from the great body of paint employed in producing the granulated surface, the copal varnish, and the gold leaf, must be of the most durable description. I may here mention, that, during the last two or three years, I have painted a very great number of drawingrooms in various styles, some with rich borders, others in my patent imitation of damask, and a few in styles similar to that employed upon Sir J. Robison's; and have papered very few. I feel very sure that as the advantages of painting over papering, especially in the public rooms of a mansion, become generally known, the latter style of decoration will be entirely given up. As to the colouring of ceilings, that must be left in a great measure to the taste of the proprietor; as some like pure white, others delicate tints, and a few go the length of the most intense colours, or polychrome. With this last class I myself agree; but I am at the same time aware, that if this be not done with the strictest attention to the laws of harmonious colouring, the effect must be bad. It would be like a person unacquainted with the science of music, running his fingers at random over the keys of a powerful organ. In the one case, white or a light tint is better than colours; and in the other, silence better than such an attempt at music. — *D. R. Hay. Edinburgh, January* 13. 1840."

Design XIV.—*A Land-Steward's House in the Neighbourhood of Inverness.*

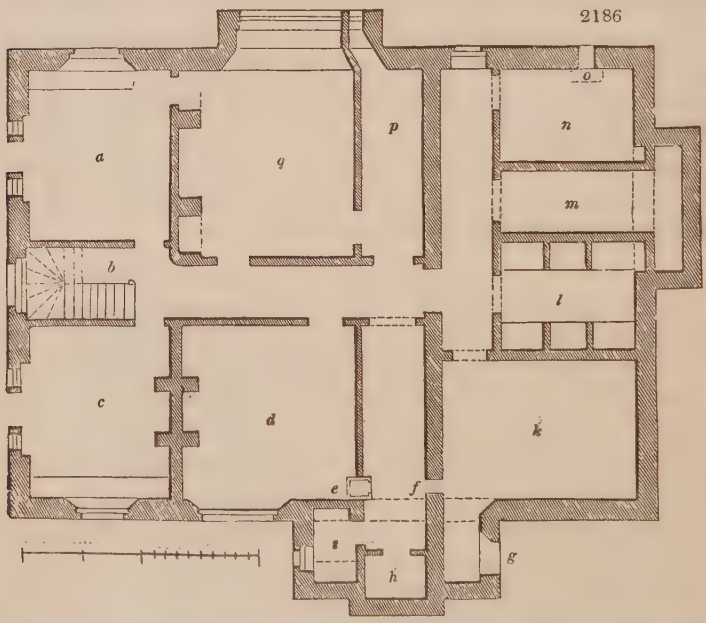
The main features of this design were given by the gentleman by whom the house is to be occupied, and the arrangement and details were improved under our direction. The elevation, which is by Mr. Lamb, is shown in fig. 2185. The simplicity of the general outline, and the compact rectangular form of the building, are favourable for economical execution, and for interior warmth; and we think the mode of heating the air of the hall and staircase by an air-stove in the sunk story, and by the same means preserving the water in the cisterns from freezing, is simple and likely to be effective. The serving-room, and the butler's pantry, are placed conveniently for the dining-room. Three sides of the building will appear rising from a terrace, on which, near the conservatory, there will be some flower-beds. In order that this house may be in some degree fire-proof, the floors of the office, the nursery, the kitchens, and all the bed-rooms, are proposed to be laid with stucco. (§ 2457.) On the drawingroom front there will be a terrace garden, connected with an orchard and kitchen-garden by an arcade of trelliswork covered with creepers, and the whole will be sheltered by a plantation, in which will be introduced all the trees and shrubs which will endure the open air in the climate of Inverness, and are procurable in British nurseries.

2389. *Accommodation.* In the basement floor, fig. 2186., there is a scullery with a sink and plate-rack (and it may also contain a baking-oven and boiler), *a*; back-stair, *b*; wash-house, with fixed washing-troughs supplied with pipes of hot and cold water, *c*; servants' hall, *d*; and White's warm-air stove, *e*. The flue from this stove

2185

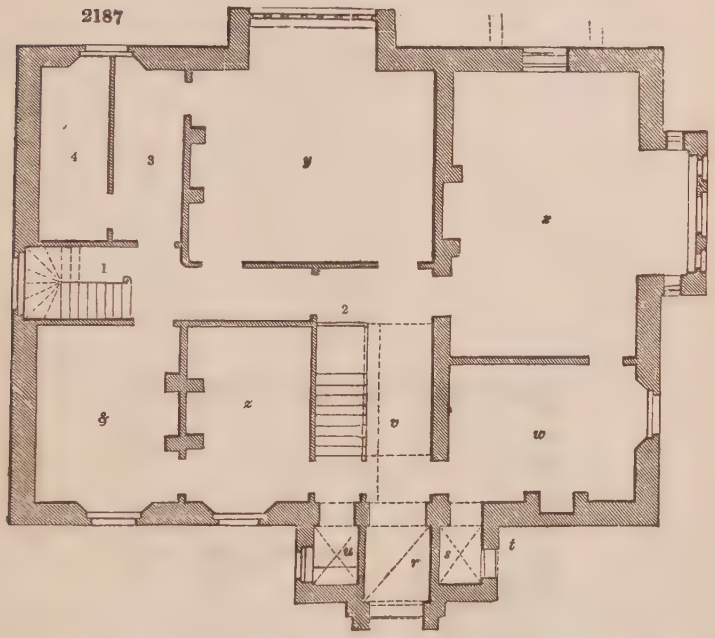
is to be conducted up the adjoining pier, and close to the cisterns of the three water-closets; while the heated air is to ascend to the hall above, *v*, in fig. 2187. This floor also contains a small door to the coal-cellar, for procuring coals for the hot-air stove, *f*; and a coal-shoot, *g*. The cover to this shoot or opening, by which the coals are to be introduced, is a plate of cast iron, made to lift up when the coals are to be thrown down; it may form the lower step to the side entrance, or it may serve as part of the floor or path before the steps: by means of an iron rod, staple, and padlock, it can easily be secured inside. A closet is shown at *h*; a servants' water-closet at *i*; the coal-cellar at *k*; wine-cellar at *l*; beer-cellar at *m*; stoke-hole to the conservatory at *n*; conservatory

2186



furnace at *o*; cook's pantry at *p*; and kitchen at *q*; the kitchen grate being supposed to contain a boiler behind, and a roasting-oven on one side. There are two back entrances; one through the back-kitchen, *a*, and the other through the wash-house, *c*; both these doors open into a small kitchen-court, round which are ranged a place for ashes, a cleaning-room, bottle-rack, &c., peat-house, wood-house, &c.

2187



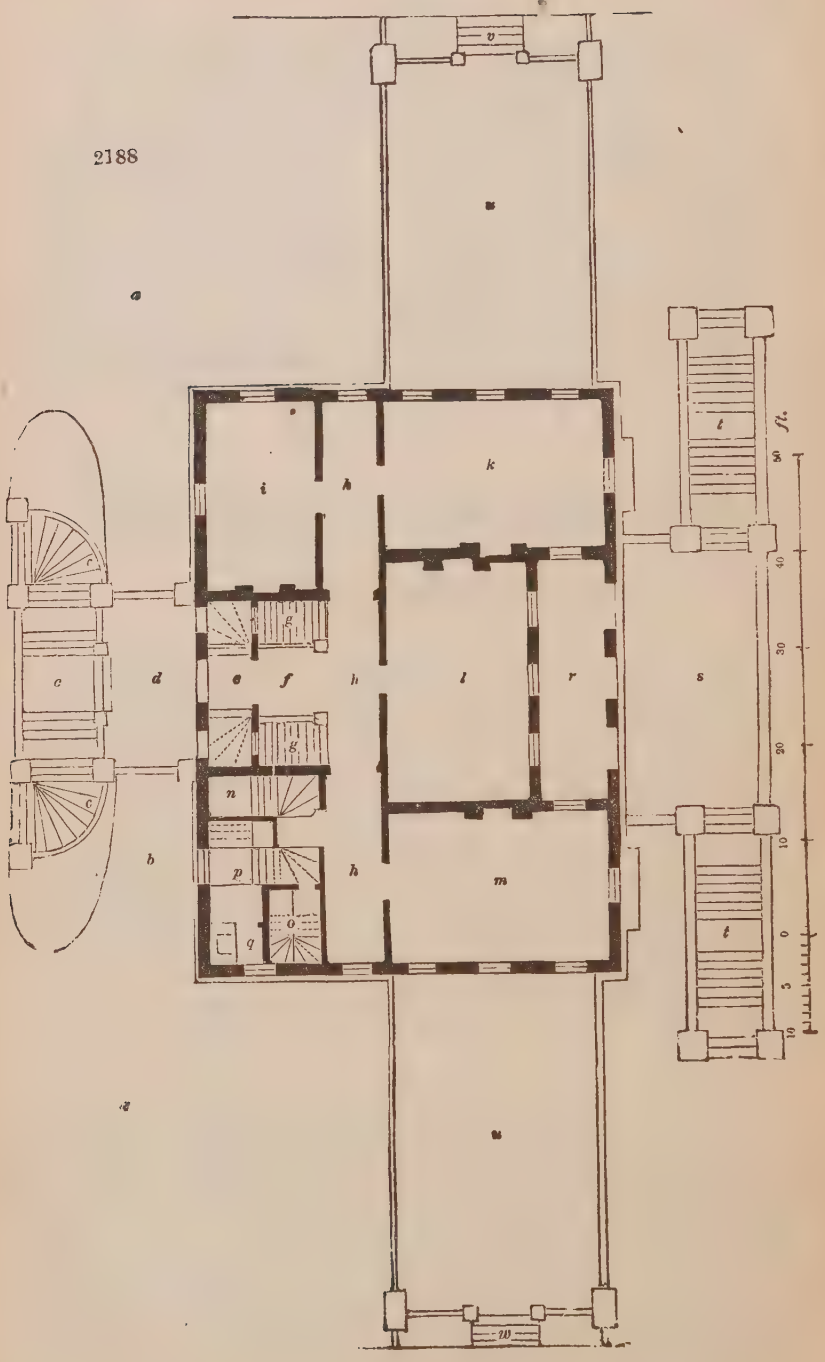
The principal floor, fig. 2187., contains an entrance-lobby, *r*; a lobby to the business room, *s*; a separate entrance to the business room, *t*; water-closet, *u*; beneath which is one for the servants, and over which is one for the bed-rooms; the cisterns and pipes being kept from frost by the heat of the stove, *e*, in fig. 2186.; hall and staircase, *v*; business-room, *w*; drawingroom, *x*; and dining-room, *y*. By introducing a temporary screen of glass, or sliding-doors of glass, so as to separate the bay in this room, a greenhouse may be obtained in the winter season, and the same thing might be effected in the drawingroom. The object in separating the plants from the general atmosphere of the rooms is, to preserve them from the dust and dry air which they contain, which is so unsuitable for plants, and partly also to make sure of their being kept near the light. There is a school-room at *z*, and a bed-room connected with it at &; a staircase to the bed-rooms at 1; a swing-door, 2, to exclude draughts of air and smells from the kitchen or wash-house; a serving-room to the dining-room, 3, which may have a hot closet and shelf, heated by the circulation of hot water from the cistern at the back of the kitchen fireplace below; and a butler's pantry, 4. Above this floor are three good bed-rooms, with dressing-rooms, a nursery, and three small bed-rooms.

2390. *Remarks.* The accommodation and its arrangement being adapted to a particular case, have been studied with the greatest care, and we consider that the result is satisfactory.

Design XV.—*A Villa in the Italian Style.* By E. B. Lamb, Esq., F.I.B.A.

2391. *The Object* of this design is to show the marked distinction of the Italian style of architecture, as applicable to a moderate-sized English villa, where utility is more attended to than expensive decoration. Fig. 2190. is the elevation of the garden front.

The style of architecture intended to be conveyed by the elevation is decidedly of Italian origin, and the general form perfectly simple, the variety in the external elevations being produced by the terraces and projecting steps. The small balconies of the chamber floor also tend to enliven the design, and are always an agreeable addition to a bedroom. If it were desirable to make the building fire-proof, or nearly so, the staircases should be of stone, the walls of solid brickwork or stone, and the joists, girders, rafters, &c., of cast and wrought iron. If the ceilings are well plastered, they will be sufficient to cut off any communication of fire. Unless very considerable expense is incurred, there must be a certain quantity of combustible material in the construction of a house, such as floor boards, window frames and shutters, doors, &c., but by some little contrivances, if fire should happen, it might be confined to one spot, and would thus soon be extinguished.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Except in bed-rooms, the furniture of private houses is not usually very combustible, unless some pains are taken to ignite it.

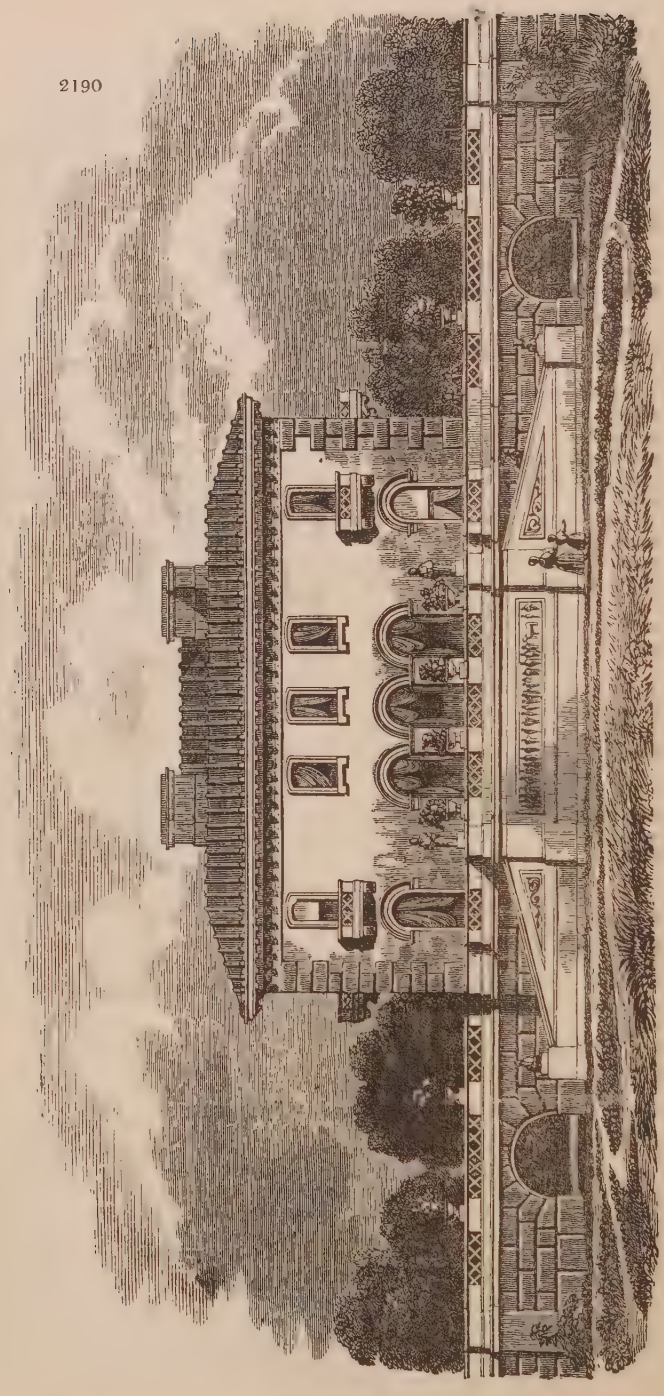
2392. *Accommodation.* On the plan of the principal floor, fig. 2188., are shown: *a*, the approach road; *b*, the road to the under hall; *c c c*, steps and landings to the hall; *d*, great landing; *e*, porch; *f*, hall; *g g*, stairs from the under hall; *h h h*, corridor; *i*, breakfast-room; *k*, drawingroom; *l*, library; *m*, dining-room; *n*, principal stairs; *o*, back-stairs; *p*, dressing-room; *q*, water-closet; *r*, arcade; *s*, landing; *t t*, steps to the lawn, &c.; *u u*, terraces; *v*, steps to conservatories; *w*, steps to billiard-room.

In the basement plan, fig. 2189., *a* is the approach road; *b*, the road to the carriage porch; *c*, the carriage porch; *d*, the under hall, with the staircases leading to the upper hall; *e*, alcoves with seats; this forms part of the foundation of the upper steps, and, for the sake of giving some pictorial effect, has been opened in this manner: *f*, kitchen; *g*, scullery; *h*, pantry; *i*, larder; *k*, servants' hall; *l*, housekeeper's room; *m*, bed-room; *n*, passage; *o*, stairs to the wine and beer cellars; *p*, china closet; *q*, stores; *r*, stairs; *s*, water-closet, and coat and boot room; *t t t*, coal and wood cellars; *u u*, archways shown in the elevation, fig. 2190.; *v*, *w*, *x*, *z*, *a'*, men-servants' bed-rooms; *y*, stairs from the terrace; over *z* and *a'* is the billiard-room; *b'*, yard; *c'*, *d'*, *e'*, under-gardener's rooms; *f'*, conservatory vestibule, with the stairs to the terrace; this vestibule should have an entire glass roof, but the walls, stairs, and other parts, should be decorated with sculpture and architecture, interspersed with flowers in ornamental pots or beds; *g'*, conservatories. The principal chamber floor contains six bed-rooms and three dressing-rooms; and the attics contain four maid-servants' bed-rooms.

2189

2393. *Description.* The house is adapted to a situation near a high road, within a short distance of a large town, but placed sufficiently far from the road to prevent any annoyance from the dust, or from idle gazers. The terrace walls divide the pleasure-grounds from the entrance drive, giving as much seclusion to the grounds as possible. The principal floor is raised upon terraces, as the views from the windows range a considerable distance beyond the private grounds, and can be seen properly only from an elevated situation, such as the terraces afford. The terraces, being extensive, afford an opportunity of obtaining considerable variety in the prospects, and, by descending to the lawn and pleasure-grounds, the scene becomes immediately changed, and we have numerous beautiful views of another description. The main entrance is placed on the north-east, and is ascended to from the double approach road by a double flight of broad steps to the principal hall, landing, and porch. The porch is entered through the centre arch, which is five feet wide, the side arches being smaller, and enclosed at the bottom, about three feet from the ground, by open paneling and pedestals bearing vases for flowers. The hall is entered through folding sash-doors, and is otherwise lighted by the side windows, which

2190



correspond in size with the small arches of the porch. These windows are filled in with stained glass. The double lines on the plan mark the situation of stone paneling, or balustrading, terminating at the ends in pedestals bearing appropriate sculpture, or candelabra. This balustrade is the protection from the stone stairs to the lower hall, of which more hereafter. It will be seen from the plan, that the hall forms part of the corridor, extending the length of this floor, and lighted at each end by rich stained glass windows. The hall ceiling is flat, divided into nine panels, by four beams intersecting each other: these beams should be of wood, or in imitation of wood; and in the centre is a panel with a circular shield within a wreath, the shield bearing the family arms painted of the proper colours. The ceiling should be supported by a deep bold block cornice, in imitation of stone. The walls are of stone, or in imitation of stone, and jointed. The corridor should be finished to harmonise, both in construction and decoration, with the hall; and at each end might be placed a vase for flowers or a statue; the vase, perhaps, would be most suitable, as in this situation any object must be almost always presented to the eye in shadow; but where the outline is of particular beauty, and the whole subject does not depend so much upon minute detail as pictorial effect, in no situation can it be better viewed; and, in fact, figures have frequently a more imposing effect when so placed than when in full light. A vase situated here might be properly and agreeably used for containing flowers; or a pedestal, with a glass globe, containing gold fish, would look well. The paving of the hall and corridors should be in patterns, resembling in their general form the panels of the ceiling: this may be effected with Portland stone, and any other stone which would contrast with it; or, if covered with oil-cloth, simple patterns are best. All the doors from the corridor should be framed in three panels, and moulded; they should be of oak, and should be circular-headed to correspond with the windows, so that all the openings should be of the same form on this floor. The handles should be of wood; ebony outside, and cut glass within the rooms. The inside panels of the doors may be ornamented with gilt ornaments, or painted upon the oak ground. If painted, the sort of ornament most suited for this purpose is a flat pattern without projecting shadows, but merely depending upon contrast of colour for effect, it being part of the architectural decoration: imitations of real shadows, or a desire to give relief to flat objects, which, if embossed, would project various shadows, is mean and unarchitectural, and can never produce the effect desired. As a general practice, the imitation, by painting, of wood, stone, or other material, is not satisfactory to the mind, and conveys mean impressions; but increasing the beauty of wood by varnish or polish, and of stone by delicate work, is far more suitable, as presenting the actual material without any attempt to deceive. All deceptions in architecture fail in producing the desired effect. Painting would also become infinitely more beautiful, if applied in a legitimate manner as a decoration, and not merely as a disguise to other materials, and more frequently to bad work.

The library should be furnished with book-cases all round the room; but great attention should be paid to their composition and arrangement, so that each side of the room should be of an equally consistent architectural character. As the peculiar construction of the room will not allow of recesses in the walls for book-shelves, without considerable expense, we must endeavour to produce as much effect as we can by detached book-cases, projecting from the walls, yet sufficiently connected so as to preserve the unity of the design. The skirting of the room must necessarily form the most important connexion; by the breaking of which round all the cases, and then again round the chimney-piece, though in this place of a different material, the line of connexion is immediately preserved in a satisfactory manner to the eye. Another connexion may be made in the cornice; the impost of the arches may very properly form the cornice of all the cases, and this would be quite high enough for book-cases in a private library. Over the chimney-piece might be a large mirror, or a piece of sculpture, and on the book-cases might be arranged, in a pleasing manner, the busts of some of the most eminent authors. The ceiling should be paneled, and coloured in imitation of wood; the principal beams might be oak, and the panels of a lighter wood. Some few raised ornaments might be placed upon the ceiling, and painted in various colours, and some gilt. Painted ceilings in allegorical subjects, or skies, clouds, moons, stars, and other things of the like nature, have happily gone out of fashion. Nothing can be so ill adapted to a ceiling as a painting with figures and architectural subjects; the situation being such, that when you do strain your neck to obtain a glimpse of them, and endeavour to unravel their mysteries, you are generally puzzled to fix a point where the design can be viewed without distortion. The painted ceilings of the British Museum are sufficient evidence of the absurdity of this practice. The custom is now completely altered, and from the dark gloomy coloured and painted ceilings of the seventeenth century, the opposite extreme is frequently taken, and flat unmeaning

plaster, with wiry ornaments which it requires the keenest vision to decipher occupy the place of learned allegorical mysteries.

In the dining-room many sculptural subjects may decorate the walls, and the ceiling may be well and appropriately adorned with heraldic devices. The entrance to the room is in the centre, and on each side should be placed pedestals, or side tables in lieu of the large sideboard, which could not be so well placed in this room. These little circumstances may frequently be the means of producing something out of the common way in composition; and in this room the door forms such an important feature that its position should not be altered. The space on each side is sufficiently wide to admit of handsome designs for the demi-sideboards, where as much display of plate may be made as any person can possibly wish for. At the back of each might be a large plate of looking-glass, which would greatly add to the splendour of the furnished sideboards. Much may be done in this way with good effect, provided a little thought were given to the subject. The windows, which should all open outside, should be glazed with some stained glass and some plain figured glass; the lower portions of the sashes should be plate glass: and in the construction of the sashes, and also in the glazing of them, care should be taken that no sash-bar should come in the way of the sight of a person of ordinary height, either sitting or standing; and that the stained glass should not be placed in the direction of a person's sight, so as to obstruct his view, except in side borders: of course, there may be exceptions to this rule.

From the dining-room is an entrance to the loggia, the ceiling of which should be paneled, so as to harmonise with the rooms to which it is attached; the decorations should partake of some of those of the other three rooms, but still, as the loggia is a subordinate object, its ornaments should be unobtrusive. The heraldic devices of the dining-room, the sombre yet marked display of the library, and the elegant lightness of the drawingroom, should all be united in this loggia; and at the same time we should bear in mind, that, as it is an entrance porch from the external part of the house, the walls should be of stone, and in the ceiling alone can the connecting links be preserved.

The drawingroom, *k*, in fig. 2188., may be decorated upon the strictest architectural principles, and still the lightness so necessary for this room may be maintained: beautifully grained wood may be distinctly shown in the ceiling, as the apparent strength might require; this wood may be moulded and decorated with gilt and painted carved work. Satinwood panels, with elegantly designed scroll ornaments upon them, would have a rich and beautiful effect; the centre panel should have a rich flower, from which should hang the chandelier. The skirting of the room might be in imitation of Sienna marble, and the walls might partake of the hues most prominent in the ceiling, and so as to combine with the skirting. The centre panel of the door might be looking-glass, upon which should be placed some decoration, picked out in appropriate colours. The windows should have some ornamental stained glass in the upper parts; and much decoration and taste might be shown, not only in the arrangement of the stained glass, but also in the form of the inside of the window-frames, bearing in mind always, that although the general character of the building may be marked as of a particular style, yet the spirit of that style may be strictly followed up without any of the minor details being copied from known examples. However much we may err in our endeavours to produce something new, this should not deter us from persevering; and, if we do so upon fixed and sound principles, success must ultimately be the result of our endeavours.

The decorations of this room may appear at first rather extravagant; but, when we consider the means that are employed for the purpose, it will be found, that in a house where architectural decoration is required, the means here employed are not too great for the end in view. Looking-glass, judiciously applied, it is scarcely necessary to remark, gives great splendour to a room.

The chimney-piece I would wish to be of Sienna marble, or, at least, the lower portion of it, which should be a continuation of the skirting or plinth of the room: this forms the connecting link between the walls and the chimney-piece, and this, in an architectural point of view, is of the greatest importance. The upper portion of the chimney-piece may be of statuary marble: it then becomes a separate part of the design, or, in fact, a part added for a particular purpose to the plinth, which plinth then holds its proper situation in the architecture of the room. It is the bearing part, the base of the whole, and its office should be distinctly marked. A distinct material can be used for the upper part of the chimney-piece with the greatest propriety; for, as the walls of the room, the plinth, and the ceiling, are of different materials, a variety or contrast in this situation will be quite admissible. Connecting lines in the general composition, masses of colour, variety of material, and a single prominent feature, make up the whole of architectural design. This single prominent feature is the leading object from which all others emanate, and it unites itself in its form and colour with the surrounding objects. Suppose, for instance, the chimney-piece were made the most prominent feature in a room, the lines of the plinth

are continued round, and the upper portion is repeated in other objects in form and colour, but in a less decorated manner, as they recede from the main feature: they continue round the room till the least decorative parts, as they radiate from the centre, meet and unite in each other. The blending of form and colour is much more difficult in architecture than in painting. In the former, the crude nature of the materials, the limited scale it must be brought to, and the necessity of making numerous and frequent changes, are disadvantages difficult to surmount, and only, perhaps, to be properly surmounted in the actual building; but in painting, the subject is in the hands of the artist at once, and when once finished no change can take place in it.

The breakfast-room, *i*, in fig. 2188., requires but few words, as what has already been said applies as much to this room as to the others. In many of the buildings designed in the present day, too much attention and expense have been bestowed on the exterior; and when you enter the house, after seeing the hall and staircase, few of the rooms present a better appearance than those of the meanest cottage: a cornice, with some enrichments, but very moderately applied, and frequently in doubtful taste, and a centre flower, supplied from the plasterer's stores, are usually the utmost decorations, even in large houses. The ceiling is flat, and as white as possible; but the walls are papered with rich papers and gilt mouldings by the professional decorator. Now, it must have been observed by nearly every person, that the bareness of the ceiling never unites with the rich covering of the walls. Let us spare a little expense externally (and frequently it may be spared without being missed), and apply it to internal decoration. Let us be consistent in our designs; and, if we have the means of giving a princely appearance to the exterior, let us remember that it should only prepare us for equal, if not superior, display within. The resources should be carefully husbanded, that the whole design may be in proper unison, admitting only just such discords as are sufficient to prevent monotony, and give zest to the general effect of the composition.

The principal stairs, *n*, in fig. 2188., should be of stone; the first flight enclosed, as shown in the plan, for the dressing-room, *p*. The upper part of the staircase may be open; and, as these stairs lead to the bed-rooms, only a moderate degree of decoration will be sufficient for them; but some basso-relievo may be very properly placed here, and some attention should be paid to the ceilings and walls, so as to preserve the strictest unity in the design. The back stairs, *o*, will be enclosed by a swing door. These stairs lead from the basement to the different floors of the house.

The landing, *s*, in fig. 2188., from the arcade or loggia, *r*, is made broad and ample, as it will form a delightful situation for flowers, for vases, or pieces of sculpture, or for many other subjects of interest, which could not be placed in the open grounds. This, with the terraces, *u u*, if supplied with seats of an architectural character, would form very agreeable lounges when the grounds were too damp to walk in. The terrace from the dining-room is properly terminated by the billiard-room, and that from the drawing-room by the conservatory. The basement plan, fig. 2189., shows the entrance to the conservatory at *f'*, and the conservatory, *g'*. All the terraces are approached from the grounds in the manner clearly indicated by the plan. — *E. B. L.*

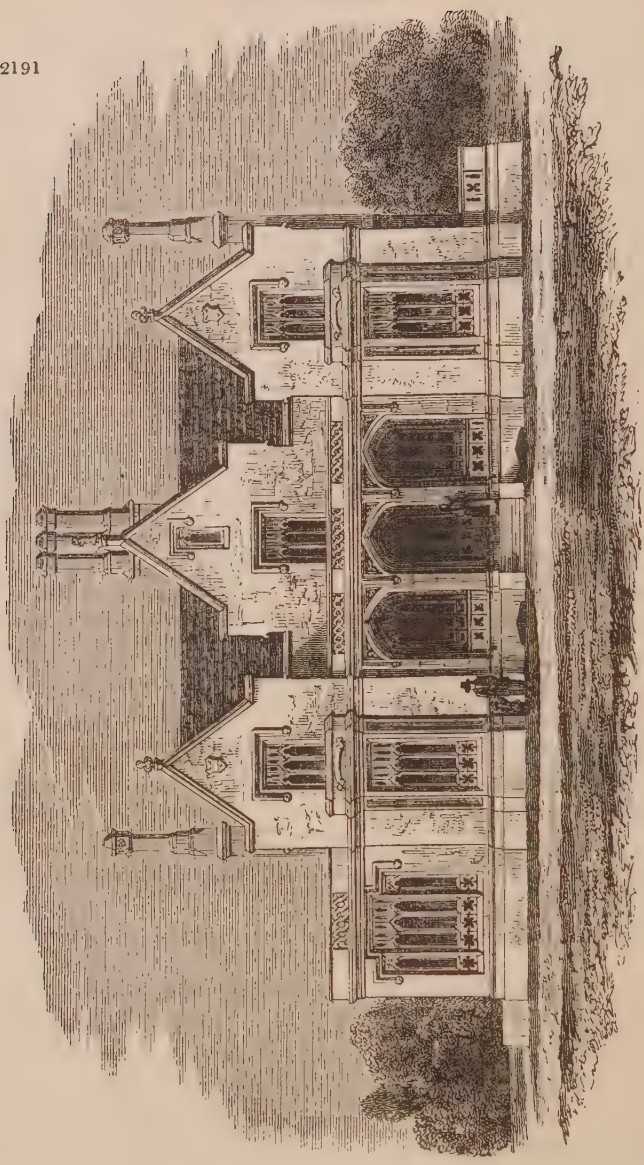
Design XVI. — *A small Gothic Villa, suited to the Suburbs of a large Town.* By E. B. Lamb, Esq., F.I.B.A.

The elevation is shown in fig. 2191. As a general remark, perhaps you will allow me to say a word or two on the wood-engravings. Frequently the artist who draws the design on the wood, previously to the cutting, from a want of knowledge of architectural forms, or, perhaps, in many instances it may be carelessness, absolutely puts into the drawing the very things I have been writing against, as in the instance pointed out in the windows of the keeper's lodge, § 2335. in p. 1175. In this design, fig. 2191., the parapet appears like a Grecian guilloch instead of Gothic perforated paneling; the arches do not present the easy curve of the Gothic four-centred arch, and the scroll label over the projecting bays assumes also a different character. In other respects, this is a good specimen of the art. It is rather provoking to see sometimes such mistakes that the character of a design is completely altered: but I will not now bring a list of grievances forward; the subjects, I have no doubt, are difficult for wood-engravers, and, at any rate, I cannot complain more than others.

The intention of this design is to show an ornamental style of architecture, to be executed in a substantial manner at comparatively small cost, as all the external decorations can be executed in Coade's terra cotta, which is certainly more durable than some real stone: the colour can be made of any tint; and, as the material is burnt in a kiln, it is harder than most stone, and much less porous. It is also much better than common cement, as it does not require colouring.

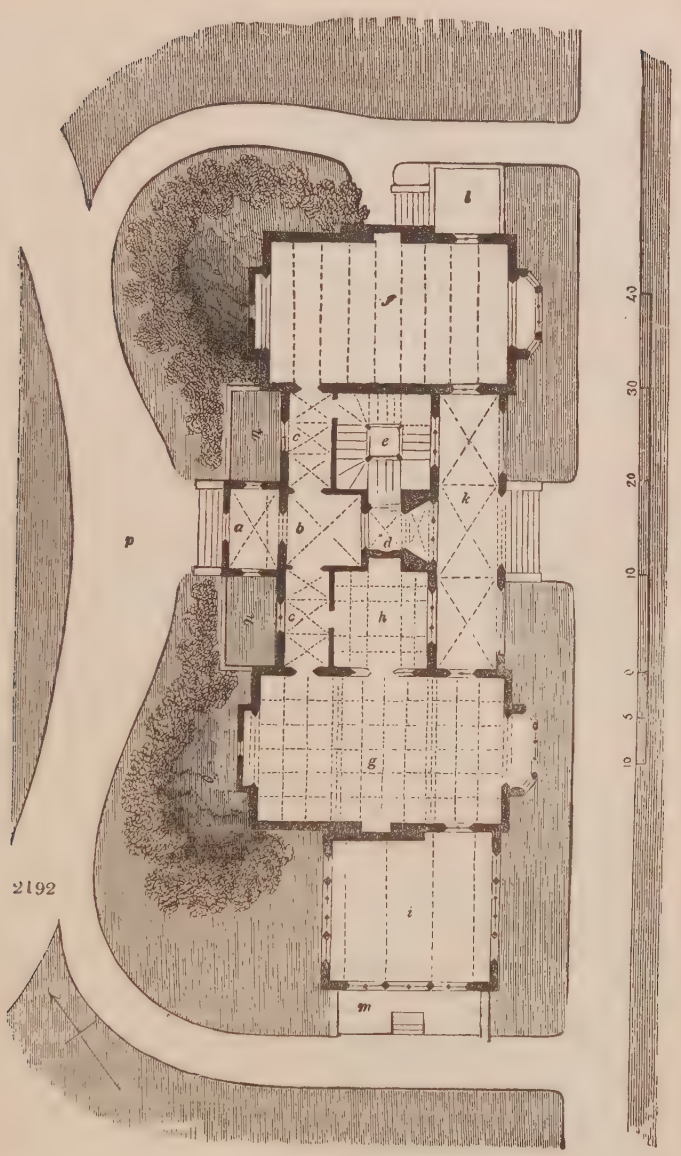
2394. *Accommodation.* In the ground plan, fig. 2192., *a* is the porch; *b*, the hall;

2191



c c, corridor; *d*, lobby to the staircase; *e*, staircase; *f*, dining-room; *g*, drawingroom *h*, library; *i*, conservatory; *k*, arcade; *l*, landing and steps down to the grounds; *m*, landing, or terrace, and steps to the grounds from the conservatory; *n n*, areas; *o o*, sunk or sloped ground to give light and ventilation to the basement; and *p*, approach road.

2395. *Description.* To the entrance of every house a porch is not only a luxury, but is necessary to protect the house from cold, and to form a suitable shelter in inclement weather. The entrance archway of this porch, *a*, should be the largest opening in this front, and it should be conspicuously decorated, in order that it may at once mark the principal entrance. In the gable there should be a panel, with an enriched shield, motto, crest, or other mark, distinguishing the owner. On the apex of the gable would



2192

be the best place for the crest. It may be objected to by some that heraldic devices have the appearance of family pride, when conspicuously displayed in their buildings; but this is not considered to be the case by architects and antiquarians. They are forms and decorations intimately associated with the style of architecture in which they are employed, and constitute some of the most interesting and picturesque combinations. In ancient architecture, they are frequently the only means by which we can trace the founder of a building, or the contributor to its decoration or enlargement: in those days, brass plates, with huge letters setting forth the names of benefactors, were seldom used, as in the present time, in which the useful decoration is seldom properly applied, but the brazen name shines forth in the most glaring manner. Heraldic forms, monograms, rebuses, and other devices, in addition to rich sculptures and appropriate foliage, form

the most interesting subjects for Gothic buildings; but none should be used which could not be shown as perfectly consistent, and connected, either with the building as a work of fine art, or with the founder as the badges of his family, his name, or his occupation. This was the custom of the "Masonic Craft:" but mark the difference of the present time. The noble buildings of antiquity are copied, not only in their windows, doors, and gables, but in their heraldic emblems; and frequently we see the arms of monarchs, palaces, and cities, monasteries, abbots, and colleges, jumbled together in one confused mass on a modern domestic building, which, with a little thought, might have been appropriately decorated with the founder's own devices. In this porch I would have the groining executed either in stone or in terra cotta, and not in plaster or papier-mâché (the latter method is now adopted at Ripon Minster for restoring the groining of the transepts); and at the angles, suitable sculpture in corbels, arms, bosses, &c. The ribs of the groining might be executed on the same principle as in ancient buildings, and the interstices built with squared chalk; a common practice with the freemasons, and very suitable from its lightness, and, if not exposed to the weather, durability; and each gusset being perfectly independent of the rib, this method is found to be sufficiently strong. All the heraldry should be properly emblazoned, and not indicated by the modern method, which is poor and insipid, compared with the effect produced by the combination of colours and gilding. A little colour in the groining, and all the proper joints of the masonry, showing the principle of the construction, is highly satisfactory to the mind: again, in the masonry, small forms of stone, in this situation, would be most pleasing, as indicating a lighter method of construction in this manner than could be produced by ponderous masses of material; the latter, presenting a large surface to the eye, conveys an idea of immense thickness, and our sensations are unpleasing, from the apparent insufficiency of the walls, buttresses, or other supports, to bear the burden. At the same time, and probably from the same cause, the large masses do not harmonise with the small general forms so well as small masses. I have mentioned sculpture as appropriate decoration, in foliage, flowers, fruit, and heraldic emblems: the judicious study of ancient examples, for their forms, would be excellent, but then the spirit that dictated the design, and the hand that executed the work, should be clearly understood and impressed upon the artist, that he may do as has been before done, viz. invent new forms, and execute them in the same bold manner, without stooping to the lazy expedient of copying, or rather moulding and reproducing, the ancient works, and placing them in inappropriate situations. With regard to heraldry, the ancient forms must be preserved: they should be considered as mere devices; and when we see animals represented in form and colour as they never did exist in nature, we can only be reminded of the uses which required these incongruities: and, as in all countries, and almost in all ages, these means have been resorted to for distinguishing persons, and are still handed down to us for the same purpose, however incorrectly applied, we should preserve them as symbols of an occasion now no longer required, and records of chivalric ages and historic legends. But not so with regard to distinct grotesque figures, busts, corbel heads, and such things: the artists of the middle ages knew not how to execute their work better; but, at the present time, it would be absurd indeed to copy the faults of the ancients. Figures should have their proper proportions; grotesque corbel heads, if used at all, should be sparingly used, and the execution should not be contrary to nature. Perfect beauty in things of this kind is not so necessary as correct anatomical proportion. Much of the good effect we observe in the application of sculpture (I mean figures) in ancient buildings is owing to the material being of the same description as in the architecture, and to the method of disposing the drapery, so that it harmonises with the architectural forms. In all ancient buildings the figures are fully clothed: there are exceptions, of course, but these are few: they are generally placed in niches (internally more especially), and have canopies over them, the niche is only sufficiently large to admit the figure, and the parallelism of the folds of the drapery, the closeness of the arms to the sides, and the perfectly upright position of the figure, embodies it, as it were, with the architecture.

On each side of the porch is a window, which, to preserve its use and comfort, should be glazed, and some small compartments of stained and painted arms, figures, or mottoes, might very appropriately be used here. The door to the hall should be of oak, with the upper panels glazed, to admit light to the hall. The decorations of the hall, *b*, and the corridors, *c c*, and the lobby, *d*, should be of the same character, and be groined in the ceiling, in the same manner as the porch: the other decorations should be also of similar character, partaking of the same forms, but in a richer degree. The two windows should be glazed with stained glass; and here might be some figures, emblems of the arts of peace, mixed with the heraldry, as appropriate historical mementos. In the hall there might be some ancient armour hung up, with banners and other appropriate implements of war; now merely preserved as matters of history, but all tending to in-

struct and give interest as well as picturesque beauty. The window in the lobby, *d*, should also have some painted glass. The effect from the porch, looking through the building to the lobby window, and then to the grounds, would, I think, be pleasing; as there would be a depth of shadow from the hall, with some half lights, forming a varied foreground to the enriched window, with its brilliant hues, in the distance. Although I would wish to have a great deal of stained glass in the lobby window, yet some should be quite plain, that the scenery may be viewed from it with proper effect.

I pass now to the dining-room, *f*. Here a distinct contrast is produced from the groining of stone to the ceiling of wood. Oak is the material usually employed in these situations in ancient buildings, but I should not object to fir; larch, for instance, would have a beautiful effect, if varnished with boat varnish, or asphalt mixed with varnish. These produce a rich brown tint without disguising the material. I know we are apt to associate meanness with deal, but if the colour be sobered down, the effect will be exceedingly good, and while much more satisfactory than painting in imitation of more rare woods, is also cheaper. The ceiling should have transverse ribs, as indicated by the dotted lines in the plan, fig. 2192., and might be curved at the ends to form an open cusped spandril, the curve terminating with a corbel. The corbels should be of stone or terra cotta: in the cornice might be carved wood ornaments, appropriately interspersed with heraldic devices, monograms, &c. In the recess for the sideboard I would have a window entirely filled with rich stained glass, which would catch the eye as the main object when the plate was displayed here, and would group the whole in the most pleasing manner. The other windows should be sparingly glazed with stained glass, as it would be inconvenient for viewing objects in the grounds, and would tend to give too sombre a character to the room. Where transoms are used in Gothic windows, great care should be taken that they come above the eye when a person is standing in a room, so that no disagreeable obstruction may prevent the view from the window. The fireplace I would take care should form a component part of the architecture of the room, and not be, what it too frequently is, of quite a different and distinct character. This was frequently the case in old buildings. For the walls, if I could not cover them with velvet hangings or tapestry (not subjects full of monstrous figures), I would use flock paper in imitation of velvet hangings; the effect would be good, and at any rate it would be quite as consistent as painting them stone colour: yet other colours might be used; and, in general, the fewer imitations there are in a building, the more perfect the effects will be. But there are some things that present difficulties in our way, and therefore paper may with propriety be used as a covering for a wall, where a covering is required in domestic architecture, and more especially where the building is not on a large scale; but in public buildings, churches, or cathedrals, it would be quite inadmissible. The windows, or rather sash-doors, at the end of the room, are convenient means of descending to the grounds or to the arcade; and the recess at the end, with the arch corresponding with the sideboard arch, would form an agreeable nook, but more useful as a "retiring place for conference" in the drawingroom.

I will pass through the corridor, which should be similarly decorated to the porch, to the drawingroom, *g*. The same principle which governed the composition of the other parts of the building should be strictly followed here. The ceiling should be of wood, but supported by two large ribs, and divided into panels, as indicated by the dotted lines in the plan. A more lively decoration is necessary for this room, more colour may be used, and gilding should be called in to aid the effect; but the main supports of the ceiling should be wood, and it should be clearly indicated as such. The panels might be richly ornamented with diaper patterns in gold or coloured grounds, or colour on gold grounds. But even in this kind of decoration in ancient times something of a heraldic system was employed; that is, metal formed the ground of colour, and colour the ground of metal; but seldom was colour the ground for colour, or metal the ground for metal; and to these simple rules we owe the most brilliant effects. In their decorations the ancients were not sparing of their positive colours. As much attention should be paid to the forms of patterns. Large forms, as I have shown before, tend to diminish the apparent size of the room, and small forms to increase the size: warm colours also give the appearance of diminution, but, at the same time, of compactness; whereas cold colours produce distance or space, but frequently a want of cheerfulness; therefore, the proportion of warm colours should be greater than that of cold colours. There are many little elegancies fitted for this room which my limits will not allow me to mention; but the cultivated and delicate tastes of the ladies would, if they built upon such a plan, soon furnish the design, so as to make it perfectly suitable to its purpose.

I have mentioned the fireplace in the dining-room, but not the material of which it should be made. In the present time we generally look upon mantelpieces that are not marble as mean and unsuitable. This occurs in consequence of their mean forms (I

speak of moderate-sized buildings) being lost in their costly material. If the marble were worked with suitable decorations and more beautiful forms, the expense would prevent its application; but if the suitable forms and decorations were executed in freestone, the comparative meanness of the material would be doubly compensated by the beauty and appropriateness of the composition. Therefore, however opposite to the present received custom, I would not scruple to use a fine freestone for this building, appropriately carved and decorated, in preference to the mean form in the costly material.

The library, *h*, is divided from the drawingroom by an open screen, behind which, when more privacy was required, a curtain would form an appropriate division. The screen should be carved wood, and of the same colour as the other wood in the room, with rich tracery, which might be partially painted and gilt, so as to produce an exceedingly rich effect, and should otherwise correspond with the decorations of the room. It should be about seven feet high, and surmounted with a rich Tudor parapet. The actual partition of the room should be arched. This library, which, in fact, may be considered only a small book-room, or boudoir, attached to the drawingroom, should be fitted up much in the same manner as the drawingroom, only preserving so much difference as would give variety to the general composition.

Much of the effect of the conservatory (which we now enter), as an architectural composition, will depend upon the walls being pierced with windows as little as possible; and to preserve the character of this portion of the building some sacrifice must be made as regards the plants, but, as the whole roof may be of glass, the sacrifice will be only to a small extent. In a house of decidedly architectural pretensions, if the conservatory is not kept up in the same manner, the pleasure we should otherwise derive from the building, as a work of art, would be destroyed. Many ways are employed to give an architectural character to conservatories; for example, by high decoration with cast-iron or wood ornaments of an expensive nature: but seldom do we see any of the forms of the main building repeated in the conservatory; too often the design is produced by a different person, whose patterns have been used in similar instances, and the consequence is, that the house and conservatory present totally opposite characters. Although we see immediately what is intended by the erection, yet the flimsy wood or iron so called Gothic architecture of the conservatory but ill accords with the massy stone of the building: the horizontal lines of the framing, the thin sash-bars, the low pitch of the roof, and the glaring white paint offer too great a contrast to the vertical character, the high-pitched gable, and the solid mullion of the building to be pleasing. These things, I am quite aware, are not so much observed when applied to a conservatory, as they would be had the building been erected for another purpose; so much are we reconciled to mean forms when associated with agreeable objects.

I have yet to say a few words on the staircase, which I would have constructed with equal regard to the strict character of the building; but I would not bestow upon it that high decoration which is so frequently done, as if the whole effect of the building depended upon the splendour of the staircase. In this building the stairs might be of stone, the balusters of bronze or iron, and the handrail of oak; the balusters should be ornamental, either in single forms or in connected paneling. There are yet remaining several examples from which, without exactly copying, we might obtain good ideas for these forms; and if we attend to the purpose for which we study them, a little more than to the wish of applying the same design, something consistent will necessarily be the result. The handrail should be in straight pieces, or merely curved upwards next the newels, which at each angle of the stairs should form the abutments; but in no case would I use the distorted, ramped, and twisted slip of mahogany, which modern ingenuity calls a handrail: it is perfectly void of beauty, and the only thing that can be said in its favour is, that the hand in descending the stairs can slip from the top to the bottom without interruption. Can this usefulness make up for its deformity?

The general effect of these rooms, if constructed and decorated in the manner described, would be, I think, satisfactory, as presenting the actual material, and using colour only as a means of giving to that material its best appearance. At once we should observe, upon entering the building, that it was substantial and consistent in construction, appropriate in decoration, and possessing an air of comfort with pictorial effect. I dwell somewhat upon the necessity of applying materials properly, that is, undisguised; as of late years the decorator, instead of the architect, is called in to complete the building, and the architect is dismissed almost immediately after the mere shell is erected. Then come imitations of satinwood, rosewood, oak, or other materials, with plaster ornaments, gilding, gaudy stained glass (if stained glass is used at all), immense plates of looking-glass in frames of all conceivable forms, gold and embossed papers of Alhambra (the fashion now) patterns; wretchedly designed furniture, with Gothic windows and gables for chair-backs; gilt curtain cornices, with inverted crockets,

pinnacles, and finials; thickly folded drapery twisted into every variety of grotesque form; Gothic fire-screens, fireplaces, stoves, sideboards, in short, every subject where two segments of a circle can be made to meet in a point: these things, which would have thrown discredit upon Batty Langley, are, after the architect has terminated his labours, thrust into his rooms, to the total destruction of all style, date, and harmony of proportion or colour. I do not wish to quarrel with the decorators; there are many who, I dare say, are capable of carrying out a design with fitness and propriety; but now nearly every house-painter or paper-hanger, without having studied any thing beyond the compounding and laying on of colour or hanging of paper, calls himself a decorator, and performs his work without knowing one principle of composition, or perhaps scarcely discerning Grecian from Gothic architecture; and the miserable result of his labour is the perversion of all good taste and sound principles.

In the elevation, fig. 2191., I have endeavoured, by appropriate decoration, to give suitable character to a simple general outline, preserving all through the decorations harmony of form: for instance, all the gables are of equal angles; the mullions of the windows of the same form and dimensions, and the openings between the mullions of the same width; and the arches only used where transoms would be liable to break from their inconvenient length. The stones all through should be small, seldom larger than a man can carry on his shoulder, and, if the walls are of brick, the jambs of the windows should show the bond into the brick and never a vertical joint; the former giving the appearance of strength, the latter of weakness. With regard to windows, much of the effect of modern Gothic, ay and of ancient too, is sometimes, destroyed by the variety of dimensions in the mullions and openings. To produce harmony of form throughout a building, very little difference in these dimensions should take place, except where sufficient reason can be assigned for it. Mullions and openings of windows evidently belonging to a series of apartments connected with each other should be of equal dimensions; but a chapel, an institution, or other building, joined to a range of domestic buildings, and requiring windows of larger dimensions or otherwise, to mark its character, should be designed upon the same principle, and the mullions should bear the same proportion to the openings as in the domestic building. A little attention to these rules would produce happy results, but a total disregard of them is mischievous in the extreme; since, if the mullions of a large window, where the openings would necessarily be large, were of the same dimensions as those of the small windows, where the openings are small, it would destroy the effect of the whole building, by presenting, by comparison, on the one hand heaviness, and on the other meagreness. To produce good effects, the balance of parts should be equal. Of external colour I have little to say, except one thing which has struck me in many instances, but more particularly during a late visit to a modern castle in Scotland, viz., that the mullions of windows that are seen from a distance should be of the same material as the jambs of the windows, and not of a dark colour; for if this be the case, the windows, at the distance the building should be seen to advantage with the accompaniment of beautiful scenery, become mere square unmeaning holes, combined with high gables, battlements, and pinnacles, apparently of a totally different character. This subject requires much consideration, and cannot be too clearly impressed upon those who wish to build. Too frequently the fear of producing heaviness in the windows obliges the architect to reduce the mullions until they become, at a proper distance to view the building, mere clumsy sash-bars; and at the point where the sky line of the building would be seen to the best advantage, namely, when the sun is behind it, the mullions are mere unmeaning lines, lose their distinctness, and produce a poor and insipid effect. It only remains for me to say that the domestic offices are in the basement, and that the chamber plan contains six bed-rooms, all of which I would erect and decorate in suitable character.

Design XVII.—*An Anglo-Grecian Villa.* By E. B. Lamb, Esq., F.I.B.A.

The elevation is shown in fig. 2193.

2396. *Accommodation.* In the ground plan, fig. 2194., *a* is the portico; *b*, the hall, *c*, the saloon; *d d*, ante-rooms; *e*, drawingroom; *f*, dining-room; *g g*, library; *h*, library ante-room; *i*, portico; *k*, breakfast-room, or music-room; *l*, principal staircase; *m*, water-closet; *n*, passage to the offices; *o*, housekeeper's or butler's room; *p*, pantry; *q*, servants' hall; *r*, *s*, china closets; *t*, kitchen; *u*, scullery; *v*, servants' water-closet; *w*, back-stairs; *x*, servants' entrance. The chamber plan contains seven rooms in the principal body of the house, and six rooms in the wing.

2397. *Description.* The object of this design is, to show the application of decided Grecian forms and character to modern purposes; not as a copy from the works of antiquity, but to be treated in the spirit of the style, as far as that style can be so treated in a modern habitation. The remaining works of the Greeks are taken at the present time as precedents, but seldom are they applied in a manner suited to our climate and customs. Precedent has been the evil genius of the art, the trumpet sound of the employer, and

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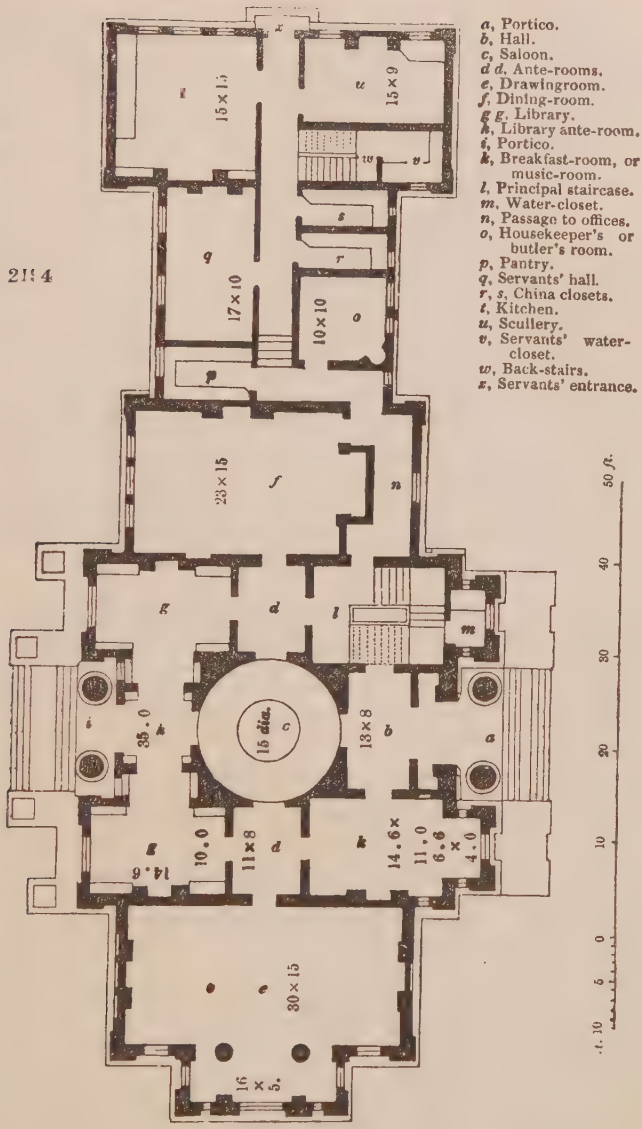

the trammel of the genuine architect. Happily, a change is now taking place, and the forms of Greek temples are seldom applied to domestic edifices. The application and arrangement of columns in modern buildings should be quite different from what it was in ancient temples; nor would I scruple to alter the proportions of columns or entablatures, if it suited my purpose. In blindly adhering to precedent, how many have failed in producing the effect they desired! How many temples have been erected with three or four tiers of windows in the height of the columns! How frequently have fitness and propriety been violated by this mistaken predilection for ancient temples! How absurd would it be to copy York Minster, or Westminster Abbey, and put floors into them, for a dwelling-house; and yet the religious edifices of the Greeks have been frequently copied in this way, without the absurdity being noticed. The characteristic

features of a particular style of architecture may be employed in a modern building, without its presenting the appearance of a temple, and in this design I have attempted to do so; preserving, in the first instance, a prevalence of horizontal lines. The application of columns, pilasters, and entablature, the introduction of square-headed openings, and, although the pediment is omitted, the raised centre and lantern, will carry the mind to that form as associated with the buildings of antiquity, and thus mark the proper adherence to precedent. I speak of the precedent of temples only, as we know so little of the private dwellings of the Greeks; but, if we knew more, probably we should be less able to apply them to our own climate than the temples.

The effect of the portico, *a*, in fig. 2194., will be greatly aided by the entrance-door being placed in the partition wall of the hall at *u*, and thus forming a doorway of solid masonry, and behind a less solidly moulded door-frame for the doors. In the recesses might be placed figures on pedestals, or candelabra; if the latter, it would be a novel and pleasing way of lighting the hall through the large glass doors. There is much difficulty in constructing the architrave over the intercolumns consistently in this style as we are frequently at a loss to obtain so large a piece of stone as will take a solid beading upon the columns. For this reason, we are obliged to construct it on the principal of an arch, and thereby destroy the propriety of the application of the architrave. This is a difficulty only to be surmounted in the way mentioned, and few people consider the impropriety of this construction, unless the architrave settles, and thus forms a curved line between the columns; it then becomes painful in the extreme to look at: this has not unfrequently occurred in some of our new public buildings. In the choice of an order of architecture, some care should be taken, if we do not use the exact copy of the antique, that it is not one that is most elaborately sculptured, as, in a very short time, the beauty of the ornament is lost by the discolorations and other effects of this climate. In fact, the materials we use being of a coarser nature than the marbles of the Greeks, the elaborate detail, however good it may be, has seldom sufficient brilliancy of light to show it to advantage. We require more decided forms and bolder execution to produce our effects.

The hall, *b*, should be the height of both stories, and should be stuccoed with a marble cement to receive a polish, if it was not entirely built with stone, which could be the case only in certain situations. On the walls I would have some basso-relievo, of appropriate subjects, and let into the wall in such manner as to form a perfect connexion with the architecture. All the doorways in the hall should have their mouldings of stone, or marble cement; the doors might be of mahogany or wainscot, or even of larch or other wood appropriately paneled, but not painted, unless the painting were used as a decoration, not a disguise.

The saloon, *c*, forms the connecting link in the composition between the drawingroom, library, dining-room, and hall, and therefore it should partake of some of the characteristics of each. It is a small apartment, but I prefer this division from the hall to making that apartment of such large dimensions as it is usually of. In this arrangement of the rooms, the saloon becomes at any time a private apartment, and can be used as an appendage to either of the other apartments, if required. Some sculpture, an ornamental coffered ceiling, supported on cantilevers, the centre being figured glass, round which, on the landing of the chamber floor, should be a close screen to protect it. The lantern-light shown in the elevation is, of course, the means of lighting that landing and the saloon. The floor might be of mosaic or marble.

From this room we pass to the dining-room. Here, as in all modern rooms in this style of architecture, there is great difficulty in keeping up a consistent construction. The width of the room will, therefore, oblige us to use wood as the principal material for all the ornamental paneling of the ceiling, but the walls might be scagliola; and in this situation I would place sculpture as the principal decoration. The sideboard should form part of the architecture of the room, and the effect would be exceedingly good, by having a large mirror covering the whole of the back of the recess, and reflecting the windows, grounds, and sculpture. In the decorations of the ceiling for this room I would provide two flowers or other ornaments, superior to the rest, from which chandeliers should be suspended. The chimney-piece should be of sculptured marble, harmonising with the walls of the room. The windows might have some coloured glass, with characteristic ornaments painted upon them, but not in gaudy colours. A severe style would be most suitable, as uniting better with the decorations of this room. Generally, plate glass suits Grecian architecture admirably, as it preserves the massy character and distinctness of form so essential to the style. Broad masses of light and shade, continuous lines, and square openings, are equally necessary. The general tone of colour should be warm; some ornament might also be painted; but this should be done with great caution, as it would be difficult to make the painted decoration harmonise with the sculpture

From the ante-room, *d*, we enter the library, *g*, *h*, *g*. The numerous breaks, and varied form of these rooms, would produce a good effect, and are capable of high architectural decoration. The bookcases would require to partake of the same character as the rooms; but if placed in recesses terminated with pilasters, and the cases only about eight feet high, the upper parts would form suitable pedestals for sculpture, bronzes, vases, &c., so that a great interest may be given to this room, in addition to its usefulness. The compartments in this room not being so large, stone might be used as a ceiling, but still I think, in this country, wood is most suitable; and by constructing the ceiling in wood, and being directed by the principles of the ancients, we might produce some new arrangement, which, though different from the forms we are accustomed to see, might be in the spirit of their buildings. An interesting question arises out of this difficulty; namely, What is the principle the ancients, when the arts were in the highest perfection, would have adopted in their ceilings had they constructed them of wood instead of stone? or, if any have been constructed in wood, what was the principle? The ante-room, *h*, in the library, would form an agreeable adjunct, and an easy means of passing to the grounds.

I will now speak of the drawingroom, which, to produce those pleasant sensations of cheerfulness associated with rooms of this description in this country, must be light and rather gay, not gaudy, in its decorations; but all the consistency of construction might as well be preserved here as in the other rooms of the house. The ceiling should be a framing of wood in coffers or panels supported upon beams of wood having all the strength necessary for the purpose. Great variety and beauty might be given by wood of various descriptions, gilt mouldings, and painted ornaments. The columns at the window recess should have their proper entablature, which should pass round the room, and should support the wood ceiling. Some appropriate sculpture in the frieze, also some, but sparingly introduced, in the walls, of figures, wreaths of flowers, &c. Within the recess, between the columns and pilasters, might be pedestals for elegant glass vases for flowers; or even small statues of marble or bronze, or other little articles of rarity, might be properly placed in this room; but, unless the furniture was designed in the same spirit, the effect would be destroyed; so that, in fact, the whole arrangement of this room should be under the direction of one person. I would have a fireplace at each end of the room, with a window over it: this should be of one sheet of glass, and should slide back at night, and into its place a shutter should slide in the same manner, but with a looking-glass on the inside. The effect, when the room was lighted in the evening, would be exceedingly striking.

As much attention to style and consistency of construction should be preserved in the breakfast-room, *k*, as in the drawingroom. The stairs, *l*, should be of stone, the balusters of metal, and the handrail of mahogany or oak; and, as I have mentioned in another place, the handrail should stop at the angles of the stairs against the newels, which should be solid and surmounted with some appropriate ornament to give pictorial effect, but not to make the staircase too prominent a feature. The arrangement of the offices is sufficiently marked on the plan; they are conveniently situated for the accommodation required in this design.

There are several effects which would require more notice than I have now time to give them. The vista from the dining-room through the ante-rooms to the drawing-room and grounds, from the variety of lights and shades, would be exceedingly pleasing; and again from the drawingroom to the dining-room, but this would be terminated by the blank wall of the room. The view, again, from the hall to the ante-library, *h*, and to the grounds in this direction, would be striking. Other views will occur upon examining the plan that may be pleasing, and would constantly be changing from the varied light during the day: and when lighted up at night, with all the rooms open, showing the proper distribution of sculpture, gilding, and other decorations, with appropriate furniture, the effect then would be exceedingly interesting and satisfactory.

2398. *Remarks applicable to this and the two preceding Designs.* In a hasty way I have endeavoured to give some account of three distinct styles of architecture, as applied to moderate-sized villas. The elevations in themselves clearly distinguish these styles, but, in addition, I will point out more clearly the marked difference of the styles generally. In the Grecian, of course, the temple forms the type of the style; the horizontal lines predominate, the cornices continue round the buildings in an uninterrupted manner, columns are symmetrically disposed, the openings have all horizontal lintels, the pediments have very obtuse angles, and the stones with which the buildings are erected are of immense size, particularly in the architraves. The ceilings, at least those we have any knowledge of, are flat, and constructed with stone, in coffers, or panels; the sculptured foliage also partakes of the same character, it is severe, but usually beautifully executed. Their statuary, which has served as models for all the schools of Europe, has still, when connected with the architecture, a severity and even formality,

which completely unites the two arts. In a general view the buildings are flat masses, with little variety, but possessing much sublimity from their simplicity of form, the magnitude of the materials, and great antiquity.

The distinguishing character of the Italian style I have adopted is great breadth of effect, by masses of blank walls contrasted with richly decorated openings, which latter are frequently curved, combining with the horizontal lines in roofs and terraces; columns of different orders placed over each other, and only used the height of each story; arches used between columns, and constructed with several stones; small stones generally used in the construction: and, internally, coved ceilings coffered, arches rising from imposts, great richness in the sculptured foliage, and generally much variety of form and masterly execution; a frequent application of colouring and fresco-painting, and statuary more varied in form, but not blending with the architecture so well as in the Grecian edifices. In a general view, the Italian manner possesses more appearance of comfort and pictorial effect, but less sublimity, than the Grecian, and its forms are more readily applied to modern architecture.

In the Gothic style, the difference is more obvious to every one; the leading features are the openings, and the prevailing character in the lines is vertical, the windows divided by mullions and transoms, the roofs are generally acute angles, the columns seldom single, but formed in clusters; no horizontal cornices upon them, but pointed arches of complex mouldings; the stones seldom larger than can be carried by one man; immense variety and beauty in the foliage; frequent representations of fruit, flowers, and leaves; a profusion of heraldic emblems; groined ceilings of the most elaborate tracery; immense quantities of statues, ill designed and executed, but still connected with the buildings from the admirable disposition of the drapery and their compact forms; gorgeous display of colours in glass, but figures badly drawn; great variety of colouring and gilding in the ceilings, niches, and canopies; rich tapestry, cloth of gold, and embroidery; all combining to produce effects of the greatest variety and picturesque character, and forming a style of architecture which it is almost impossible to believe could ever be traced back to the simple grandeur of the Greek temples. Picturesque and interesting, and intimately associated with our earliest history, and furnishing as it does many valuable precedents to study from, there is still much difficulty in applying this style of architecture to modern buildings. Our knowledge has extended, our customs improved, and we wish to combine the useful portions of each style into one that will meet our demands; but this has not yet been done. Perhaps, when a few years more have rolled over, some mightier mind than all who have passed before him may blend in one perfect style all the useful and beautiful now scattered amongst so many —*E. B. L.*

Chap. III.

Farm Buildings.

We are not aware of much improvement having been made in this class of buildings since the publication of the Encyclopædia. Several plans of farmeries have been given in the *London Farmer's Magazine* for 1839 by Prof. Donaldson; and the same gentleman has just published two plans in his *Treatise on Manures and Farming*, of which, as they may be considered as models, we shall here, with his permission, give copies. Prof. Donaldson is a native of Berwickshire, and has practised the most approved modes of farming in that county, in Ayrshire, in Northumberland, in Leicestershire, and in Kent; and he is now Professor of Agriculture in the Agricultural College at Hoddesdon. In short, we know no person whatever so competent to give plans for farmeries adapted to the most approved systems of agriculture, as Prof. Donaldson.

2399. *An improved Farmery*, Prof. Donaldson observes, will often induce a tenant to pay interest on the cost during a lease of twenty years, besides offering a better rent for the farm. But a new farmery, he says, is not always an improved one. "In many places, where large sums of money have been expended in erecting farm buildings, very glaring blunders have been committed, and much ignorance has been displayed, even of the most simple and evident details of practice, arising from the incompetency and conceit of the persons employed, who have never practised the art they pretend to assist, and therefore do not know the wants they attempt to supply. The landowner generally makes an unprofitable expenditure in unnecessary erections and in useless decorations, or is led away by the plans of architects, who, however well qualified to build dwelling-houses, Gothic windows, pointed arches, and spiral columns, experience has shown to be miserably deficient in contriving and placing the accommodations required on a quantity

of land in cultivation. The economy of labour that is derived from the juxtaposition of objects that are required to act or to be used in combination has been wholly disregarded; barns and rick-yards have been placed at opposite sides of a large farmery; stables and cart-sheds in a similar manner, and the granary removed to a distance from the barn, for the apparent purpose of creating useless labour in carrying the grain from one place to the other. Farm horses are often allowed to enter by the fold-yards, and in many cases must travel round the farmery to reach the cart-shed. Many similar blunders might be pointed out, which must be obvious to any experienced person, and which abound in the best publications on the subject. However simple the matter may appear, no person is capable of devising plans of convenient farmeries without the most intimate knowledge, from long and continued personal experience, of the most minute details of practice; and the first requisite is to ascertain the number and size of buildings that may be required for any lands under a certain system of cultivation, without too much curtailment to create inconvenience, and without any useless appendages that require an unnecessary expense, and the second how to connect them so as to afford the greatest possible convenience with the least possible labour."

2400. *In Prof. Donaldson's Model Plans*, the form of a square with an open front to the south, as a warm exposure, has been adopted as the most suitable and convenient for the purpose of combining the necessary accommodations, and at the same time separating the different parts so as not to incommode each other. He has given two designs, each adapted for three hundred acres of arable land, the one with the yard separated from the buildings by a road, which leaves the yard detached in the centre of the square; and the other with the road exterior to the buildings, by which the yard occupies the whole interior of the square.

2401. *Model Plan No.* 1., *fig.* 2195. In this plan of a farmery, "a road of fifteen feet in width divides the covered houses from the open sheds, and admits no disturbance to

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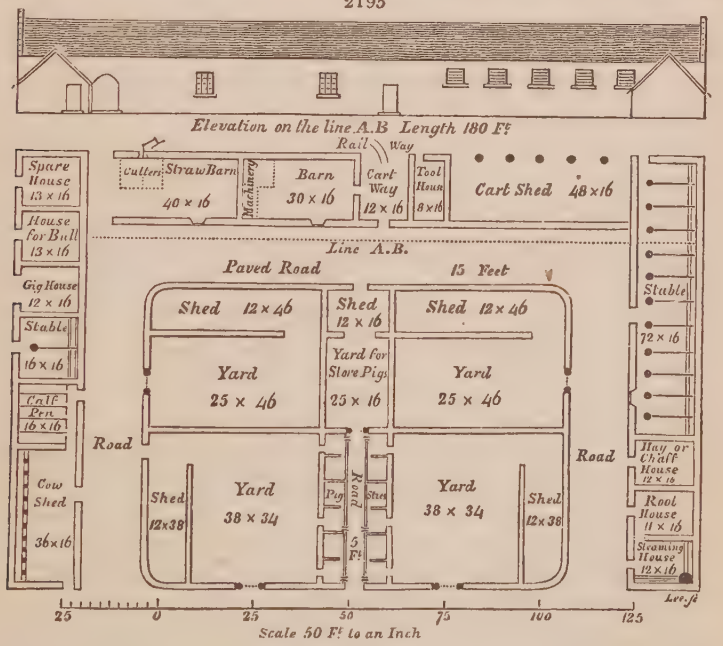

the cattle, except in supplying them with food, which may be much lessened by delivering it through holes in the walls. This separation is of great importance, though the plan has met with the objection of occupying space unnecessarily in the interior of the farmery, and hence our second plan, fig. 2196., is given, in which the road is outside the houses, which saves room in the interior, but with the objection of causing a passage through the feeding-yards, and with many persons this objection would have great weight. The admission of any passages through yards, as the drawing of grain threshed or unthreshed, the entry of any thing except the cattle and the carting of the food and

dung, is discarded in this first plan, and each department is arranged so as to afford mutual convenience, and at the same time admit carrying forward each separate business without intruding on another.

2402. " *The Dwelling-house, Garden, and Orchard* are supposed to be placed on the west side of the farmery, as being the most sheltered quarter in our climate; but in particular situations either side may be adopted, and probably an eligible situation may occur partly in front of the farm-yard, though that exposure may better be left open. On the end of the west wing of the farmery, adjoining the dwelling-house, the cow-shed is placed, for the sake of convenience, and extends thirty-six feet in length, and will contain ten cows, and the inside width of sixteen feet will afford a feeding-passage, if thought necessary. The calf-pen extends sixteen feet in length, and is divided into five apartments, for one calf in each, either for weaning or when suckling, the bottom being laid with thin laths, or with boards bored with auger-holes, and provided with a drain or open space underneath, that the calves may be on a dry bed. An inside communication to the cow-shed admits the calves to be suckled with as little labour as possible. A stable of two stalls of eight feet each in width, which may be converted into loose boxes, is intended for the riding-horses, and a gig-house is placed next to it; and both houses may be opened to the west, for the convenience of the dwelling-house. A house for a bull or any single animal opens into the yards, and the spare house at the end may open westward, and also communicate with the straw-barn, and serve any purpose that may be required. The exterior length of the wing is 114 feet.

" The back range of the buildings comprehends a straw-barn of forty feet in length, in which machines are fixed for cutting straw, hay, and roots, which are driven by the threshing machine when at work, and by a shaft for horse power when required. Wide doors open on both sides, and all the roots and hay are introduced from the stack-yard, which is placed immediately behind the range of buildings. The length of forty feet may afford ample room for cutting all food for cows, feeding-cattle, and horses, for which purpose deep mangers must be provided on the ground. Straw for litter may be cut by the same machine, by making a change in the power of the feeding rollers. Doubts are yet expressed of the utility of cutting any food for stock, and it certainly wants confirmation; if it be not adopted, the barn will contain the straw and trussed hay, and the root which will be in daily request during the winter, and the length of the house could be partitioned for that purpose. The threshing-barn is placed next, and may be used by any kind of machinery; the unthreshed corn is brought into the cartway adjoining, and thrown to the second floor. An inside stair leads to the granary over the cart-shed, which is forty-eight feet in length, and consists of six arches for holding carts and other implements, exclusive of a tool-house; the second floor extends over the end of the stable, and affords an opportunity of conveying into a chest the grains allowed to the horses, without any labour in carriage. When the grain is bruised by machinery, it may be conveyed to the stable by the same method, and given out in measured quantities, cut straw being used at pleasure, which may be lodged in a bin in the hay-house or straw-barn. A range of granary does not appear to be an essential requisite on any farm, but it may be useful in containing grain, cheese, and wool, and the expense of raising side walls is not very great, nor the flooring that is required for the purpose. The grain for market is let down into the carts in the shed by means of a pulley fixed in the cross beams, and through a trap-door in the floor. The external length of the back range of building is 180 feet.

" The east wing of the farmery comprehends a stable of seventy-two feet in length, with a loose box in one end, and the corn chest in the other, and an end door leading to the cart shed, and another in front for a communication with the yards. A hay-house adjoins, and may be useful in containing cut food, and occasionally for a sick animal, or any similar purpose. A root-house is placed next, and may open eastward, for the purpose of receiving roots from the rick-yard; and communicates inside with the steaming-house, in which are prepared in vats and boilers all cooked food for any stock, cows at calving, and particularly for pigs and poultry. The accommodation for the latter kind of stock is shown separately, and will be hereafter described.

" A paved road of fifteen feet in width runs round the inside of the farmery, and gives access to each yard and house, without entering into any one enclosure in order to reach another. The interior space is divided into four yards, with sheds 12 ft. and 16 ft. in width, which may be covered by a common roof, or raised in the front wall and slope backwards, in the manner of an attached building, which will prevent the cattle displacing the tiles or slates with their horns, if a roof of asphaltum be not preferred. The bottom of the yards is sunk about two feet below the surrounding locality, and that of the sheds is raised to throw the water outwards, that the cattle may lie in a dry apartment. In order that the yards may be of a square compact form, a cross wall divides the space equally, and the front yards have sheds placed longitudinally, that the sun may

not be excluded from the yards behind by a cross position of the sheds in front. The piggery is placed in the middle of the interior space, and contains a yard and shed for store pigs, which is supplied with litter from the stables, as that article forms an excellent bed for the swine, which must be well supplied with green food during winter and summer; and a few small animals may be allowed to run at large in the yards, to pick any offals that may be dropped, and they are found to move and turn the manure very beneficially. Six or eight sties are built in the remaining space, for brood sows, and for the feeding hogs; and each house is provided with a back-door, by which the dung is at once discharged into the yards; and it is very necessary that all kinds of dung carried into the feeding-yards be spread evenly and thinly over the whole surface, that an equal mixture and quality may be obtained. A road of five feet in width divides the rows of sties, and by it the food is brought forward in a wheeled carriage from the steaming-house.

"A pump may be sunk in a convenient place, or a pond formed, and water may be forced into a cistern placed in the roof of a shed or spare house, from which, by means of pipes and ball-cocks, it may be supplied to the yards in troughs, which may be placed in the division walls, and thus supply two yards by means of one article; or the water may be supplied to the troughs, as it is required, by pipes leading directly from the pump. The feeding-cribs may be placed in the sheds, and the turnips supplied through openings in the walls, and the cattle may eat under cover. Cribs standing in the open air, and made of wood or built with stones, with close bottoms, are found to retain much filth; and movable boxes, with latticed bottoms, are now preferred. The bottoms of the yards are intended to be flat; but if moisture be in excess, a declivity may be formed, and the liquid matter carried in a drain to a sunk pit or reservoir, where it will be absorbed by earths, along with similar substances. In most cases, the straw and litter will absorb all the moisture, but if it abound very much, such an application will be more useful than in a liquid state. The wings of the farmery are one story in height, and the range of barns and granary extends to two floors, or sixteen feet: a height of three stories has been proposed, that the grain may pass through two fanners, and be prepared at once for the market. All the walls are supposed to be of stone and lime, or brick; the doors, gates, and all articles to be plain and substantial, and the posts of wood, as they are easier repaired and less susceptible of damage. This farmery will cost about £600."

2403. *Model Plan No. 2., fig.* 2196. "In this plan, the road is outside the farmery. The north range extends in length one hundred and seventy feet, and comprehends barn, straw-barn, and stable, and spare house; the straw-barn being considerably larger than in the former sketch. The straw and roots introduced from the stack-yard are proposed to be cut in the straw-barn, and then conveyed, cut or uncut, by the central road of ten feet, which divides the farmery, and may be given to the cattle in the sheds on both sides, through openings in the walls. The stable contains a walk to communicate with the straw-barn, from which all the provender will be carried to be placed in the mangers. The cart-shed, tool-house, and open shed for cattle in the front yard, occupy the east wing, and on the opposite side of the yards, which are divided by a cross wall, there are a steaming-house on the end of the buildings, and a root-house, which extend the length of the front yard; the remaining space affords a shed for the back yard, and a small shed for the pig-yard, which is placed here to obtain the benefit of the litter from the stable, and divided by an open paling fence to admit the heat of the sun. On the opposite side of the central road, the longitudinal extent of the back yard is occupied by a shelter-shed, and a small feeding-house where five cattle may be tied up to feed if desired; the extent of the front yard is occupied by a shed, and a house for a bull on the end of the range. The cow-shed, calf-pen, riding-stable, and gig-house, all of the same dimensions as in plan No. 1., occupy the west wing of the farmery, and are convenient to the dwelling-house. The granary that may be required can be raised over the spare house, and gig-house, and riding-stable, or over a part of the straw-barn, and not unfrequently over the threshing-barn, but in both cases very inconveniently; and the first position is most eligible, as it affords an inside communication, which is an object of great convenience. The pigsties are placed inside the front walls, and are convenient to the steaming and root houses, and to the wash of the dairy and kitchen. A separate piggery, in the form of a square, may be placed opposite the central road, with sties ranged round, and enclosing a yard for store-pigs in the centre. This arrangement may be preferable, as it is convenient for the steaming-house, and removes the smell of pigs, which is thought to be very offensive to cattle. A pond of water in the yard would be useful, if it could be got. The moisture from the yards is conveyed, if necessary, to a pit, as in the former plan; the walls are intended to be plain work, of brick or stone and lime, and the roof to be slates or tiles. If decorations be wished, the eaves may project, and an arch may

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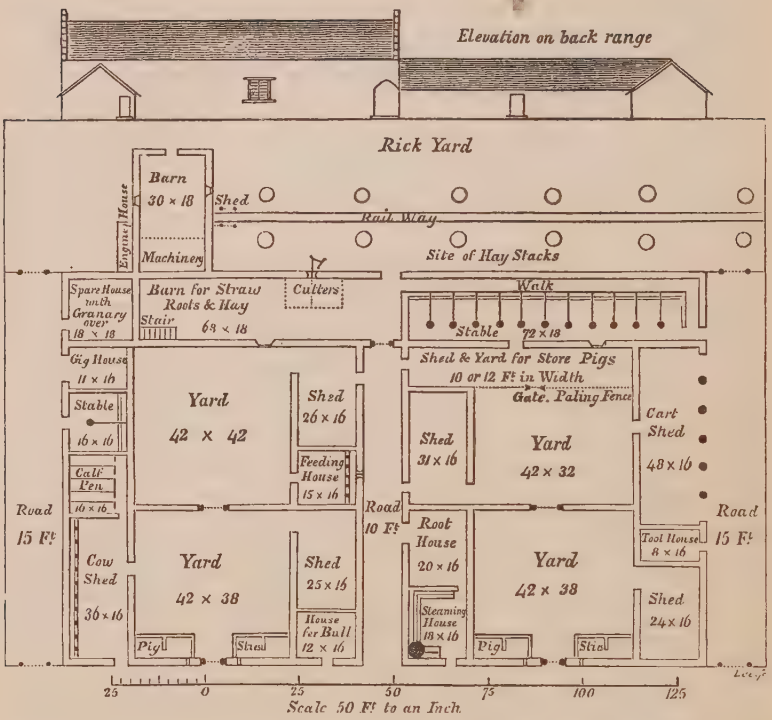
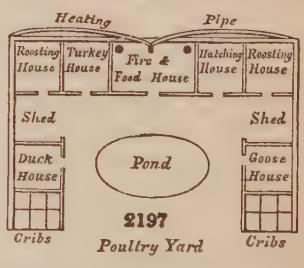


be thrown over the south end of the central road, in both plans, and may contain a pigeon-house, and be surmounted by a clock. Some small architectural decorations may be added, which would vary the uniformity of plain building, and much improve the appearance.

2404. "*The Poultry-yards* are here made a separate erection, which may be placed on any dry sunny situation that may be convenient to the dwelling-house and farmery. Suitable provision is seldom made for this kind of stock, which is generally huddled into one house in a corner of the farmery, without any regard to distinction or separation. The small square here shown in fig. 2197. may be built of timber in warm latitudes, and may be very cheaply erected in any place. Each kind of animal is provided with a separate apartment, which may be heated as the nature of the species requires. The food is chiefly composed of boiled or steamed potatoes, mixed with the flour of light grain, cooked in the steaming-house, and given to the poultry in troughs under the shelter of the open sheds. The small cribs leaning on the ends of the wings of the square are intended for the purpose of confining the young broods of any kind, until they are grown sufficiently strong to go to the roosting-houses. Such separate confinements may be found very convenient.



2405. "*Pasture near the Farmery.* A field of permanent grass, near the homestead, to serve as a pasture for the cows, is a valuable acquisition, where it can be got well sheltered and watered. If it does not exist, and if locality suits, a new formation should be effected, in order to obtain convenience in labour and travel. A paddock is also necessary, and in many places the orchard will suit admirably for the young calves that are weaning, to which they may be brought in succession from the calf-pen, and taught to eat green food, and may then be removed to the pasture-fields. A shelter-shed must

be provided; and the same convenience will suit for lambing the ewes in the spring, which process will be finished before the season admits the exposure of calves in the open air. This enclosure and the cows' pasture must be enriched by top-dressing, frequent rolling, harrowing, and duly provided with water and shelter.

2406. " *The Rick-yard.* In both plans, or rather in No. 2., the ricks of grain stand in two rows, with a railway between them, along which a light four-wheeled waggon will convey the unthreshed grain to the barn, and may be moved without horses, as the railroad may have a slight inclination to favour that purpose. The way may be constructed with flat stones, or with cast iron, as may be found most convenient, and runs directly to that part of the barn whence the unthreshed corn is supplied to the feeding-board. But each rick might stand on a four-wheeled platform, in the same position as shown in the plan, and at a sharp angle of divergence, for the purpose of running easily into the railway; and the entire rick would be conveyed to the barn, and placed under a light covering on posts erected outside the barn walls; and the unthreshed grain would be pitched to the second floor, through a door with a lowered platform. A travelling carrier, driven by the machinery, may be devised to convey the sheaves of grain from any quarter, and deposit them on the second floor, which would add to convenience, and save labour. By the plan of moving the entire rick under cover at once, any damage from rain by exposure during the process of threshing would be avoided, which, on large farms, is often attended with much inconvenience; and the expense of the iron railway, and of the wheeled platforms, will not much, if at all, exceed the cost of stone or iron stands for each rick, and the yearly expense will be saved in horse labour by the usual mode of carting, which on a farm of the extent now mentioned will amount to the sum of £3. to £4. If the barn were built on a line with the western wing, the railway would be lengthened, and would afford more room for ricks; and as the straw-barn would be enlarged, a house may be divided by partitions at the end near the open way, for the purpose of containing the cut food of roots and straws. If the spare house form part of the barn, the latter would project only about twelve or fourteen feet; and in that case the railway would run to the end of the barn, and deliver the unthreshed grain to the second floor. A transverse motion of the machinery might be devised to throw the straw longitudinally into the straw-barn. Covers for ricks may be adopted of caoutchouc or waterproof clothing, which, being easily applied and removed, will protect newly made ricks from damage, until time be obtained for threshing. If such coverings be not adopted in the full number of ricks, a few of them on every farm, especially in wet climates, will be found very useful for the above purpose. The rick-yards may be laid with gravel and broken stones, and should be surrounded with a sunk fence, or a wall with a hedge inserted near the top or midway. In a corner of the rick-yard, a shed with a light roof may be placed, for the purpose of keeping dry a few loads of corn over a wet night; and it would be very useful in covering any implements not used constantly during the year.

2407. " *Machinery* is adopted for threshing grain, on the principle that it produces the result at one fourth or less of cost incurred by the usual mode of flails, and the necessary accommodations are erected at one third less expense at the outset; and the saving effected in both ways may be applied to increasing the produce, which will afford profitable labour in the production, additional employment for the machinery, and a more abundant supply of the necessaries of life.

2408. " *Horses are preferred to Oxen* in performing farm labour, and carts to waggons in general, because experience has most amply demonstrated that lands can be cultivated in the most improved modes by the former, without any assistance of the latter, but not in any case by the latter without the aid of the former, and with equal profit and advantages in the despatch and economy of labour.

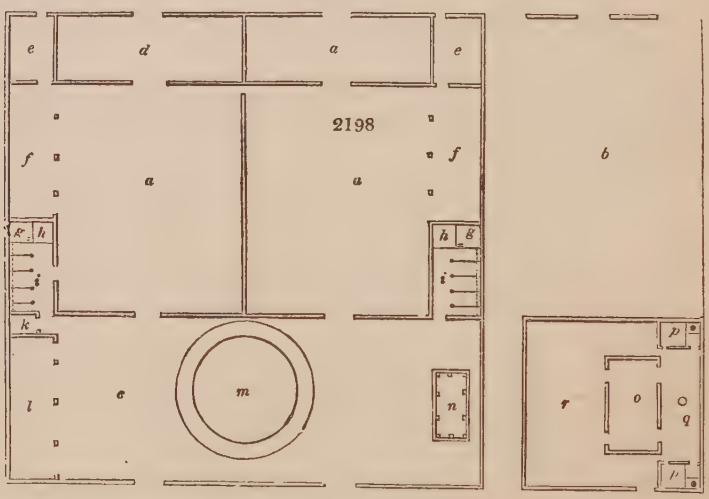
2409. " *The Dwelling-house* should be constructed to afford ample accommodation. The dairy should be placed near the cow-shed on the west wing of the farmery, and, being half-sunk into the ground, will enjoy the coolness of the eastern exposure, which may be much assisted by a plantation of tall shrubbery. The cheese may be made in the pressing-room, and may be half-dried on latticed racks, and may be afterwards removed to an airy place in the granary, which may be separated and fitted for that purpose. The offals of the dairy and kitchen may be collected in vats, and prepared by cooking with farinaceous matters, and then given to swine; and not unfrequently it is given in an unmixed state. Of all kinds of live stock, pigs are most benefited by cooked food, and it may be justly supposed that the cold mass produced by souring may be advantageously superseded by a cooked application of the different substances.

2410. " *Six Cottages for Labourers* will be required on a farm of this extent, and may be placed not far distant from the farmery, in some situation where suitable spots can be found for gardens, and where an unsightly intrusion shall not be made on a methodical arrangement of the farm." (*Treatise on Manures, &c.*, p. 383.)

2411. *On the Management of the Farm-yard*, and on various other matters connected with it, many excellent practical observations will be found in Prof. Donaldson's work, which we cannot too strongly recommend to the reader who is at all interested in farming. In the *Book of the Farm*, an excellent work by Mr. Stephens, editor of the *Quarterly Journal of Agriculture*, some good designs of farmeries will also be found, adapted for the same style of farming as the model designs of Prof. Donaldson, arranged on the soundest principles, guided by experience; and all the fittings up and furniture of farmeries are given in that work in great detail, and illustrated with engravings in a very satisfactory manner.

2412. *The Park Farm-yard at Goodwood.* In the *London Farmer's Magazine* for November, 1841, there is a plan of a farm-yard erected by His Grace the Duke of Richmond in the park at Goodwood, Sussex. The editor observes of it, that "it is not calculated for business upon an extensive scale, but taken as a whole is one of the best, if not the best, and most convenient which he has seen." (Vol. iv. p. 326.) The merits of this plan, as compared with those of Prof. Donaldson's models, are not great, but, as compared with Sussex farmeries in general, they appear to consist in keeping the cattle yards distinct from the implement-houses and stable-yards.

Mr. Curtis of West Rudham, near Rougham in Norfolk, who has paid great attention to farm buildings in his part of the country and in Suffolk, says that the great objection to most farm-yards is, that the barn communicates directly with the yards, which consequently become thoroughfares, and the stock in them, whether fattening or otherwise, are disturbed whenever anything is carried to or from the barn. In the plan, fig. 2198., *a a* are dung or cattle yards; *b*, the rick-yard; *c*, the yard to the stables and



cart-house; *d d*, barns, each eighty feet long by thirty feet wide; *e e*, enclosed hovels for implements; *f f*, open sheds for oxen, each sixty feet long and twenty feet wide; *g g*, hay-lofts; *h h*, bed-rooms; *i i*, stables, each forty-two feet long by twenty-three feet wide; *k*, poultry-house; *l*, cart-house, sixty-five feet long by twenty-four feet wide; *m*, pond; *n*, granary, thirty feet by twenty feet, supported on stone pillars, with projecting caps; *o*, double cottage; *p p*, washing-houses to cottages; *q*, well; and *r*, garden.

2413. *The Demesne Farm-yard at Putteridgebury*, the seat of Colonel Sowerby, near Luton in Bedfordshire, when finished, will be one of the most comprehensive and best arranged park farmeries in England. Besides feeding-houses for cattle, it contains open sheds and yards for feeding sheep, a complete range of poultry-houses heated by hot water, an elegant dairy, a brewhouse, and a bailiff's house. All the stalls for the cattle are supplied with water delivered into troughs by pipes from an elevated source, and all the liquid manure is drained into one large tank. The buildings have brick walls, and they are thatched with reed, the ridge of the roof being finished with plain tiles, reaching down three feet on each side, to protect the reeds from pigeons. All the subdivisions of the yards are of strong fencing, formed of wrought-iron rods; and the whole is so arranged, that every part may be inspected by the master and his friends from a

path, sometimes under cover and sometimes through the open yard, without coming in contact with or disturbing any of the animals, or walking among anything offensive or that can soil the shoes. The effect of the whole group of buildings from the park and the pleasure-ground is excellent, and from the latter scene there is a private entrance. The arrangement is not yet quite completed, otherwise we should have applied for permission to publish the plan.

Chap. IV.

Schools, Inns, Workhouses, and Almshouses.

A great many schools have been built in different parts of the country within the last ten years, and a great many plans have been published in the *Minutes of the Committee of Council on Education*, printed for the House of Commons in 1840, but we are not aware of any new feature in school arrangements. Some very handsome elevations have been sent us by Mr. Lamb, Mr. Wild, Mr. Elliott, Mr. Henderson, and others; but we have preferred giving a design from Parker's *Villa Rustica*, and the details of a small Sunday-school erected in Warwickshire; because the former design is in a style at present little used for schools, and the expense of the latter is within the reach of a great number of persons. We have given only two public-houses, but they are very handsome ones; and we have added to this chapter a union workhouse, as a specimen of that description of arrangement, and a design for a row of almshouses.

Design I.—*A School in the Italian Style.*

This design, of which figs. 2199. and 2200. are elevations, is taken from the Third Part of Parker's *Villa Rustica*, by the kind permission of the author. The whole of

this part of Mr. Parker's work consists of plans, elevations, and views of school-houses in the Italian style. These are all of great originality and beauty, and we consider their publication at the present time (1842) peculiarly fortunate, since there is a general tendency throughout the country to build schools in the Gothic style, with but few exceptions, even in favour of the Elizabethan manner.

The designs for schools published in the *Minutes of the Committee on Education* being all by the same architect, and that architect also the author of the numerous designs for union workhouses published in the *Reports of the Poor Law Commissioners* there is a degree of sameness of style in both schools and workhouses, and of meanness in the elevations given for the schools, that in point of taste is to us quite intolerable.

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This is a subject which, in our opinion, demands the notice of the legislature, or of public bodies; for why should not the exterior appearance of schools and workhouses be cared as much for by the nation as the dress of soldiers or sailors, or the architecture of other public buildings? That only one artist should have been employed by the Poor Law Commission to design the whole of their published plans, and that the same artist should also have been employed by the Committee of Education to design the whole of

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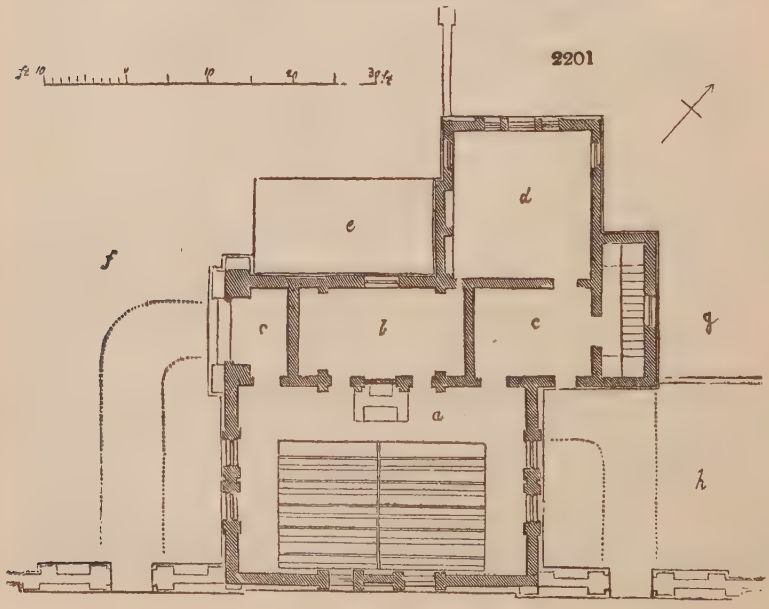


the plans of schools published in their *Report*, amounting to twenty-three, when there are so many able architects in the country, we consider to be disgraceful to these bodies.

2414. *The Accommodation* and the details, as shown in Mr. Parker's ground plan, fig. 2201., consist of a school-room, *a*; class-room, *b*; lobbies, *c c*; master's room, *d*; shed, *e*; play-ground for the senior division, *f*; for the junior division, *g*; and master's garden, *h*.

2415. *Description.* "The building," Mr. Parker states, "has two entrances, with lobbies for the children's hats, and a small class-room. It is intended to instruct the boys and girls together, but, if this be found inconvenient, a movable partition of wood affords the means of separating them. Communicating with the school-room is the residence of the master, containing a sitting-room, two chambers on the upper plan, with convenient offices in the basement. The play-grounds are divided into two compartments, one for the senior and the other for the junior scholars, and both are under the master's supervision. The sketch given in fig. 2199. conveys the front view of the building. At each end there are separate external entrances for the boys and the girls. The light in the interior is obtained on three sides of the school-room, and the windows are raised sufficiently above the floor to allow all the operations of the master to be seen by the scholars without fatigue or distraction. The door-way, bell-turret, and gable ends of the school and master's house, all severally features of Italian architecture, form portions of the view shown in fig. 2200. The principal window is composed of two circular-headed openings, making together a graceful combination, and differing from the apertures on the side of the building. The chimney-shaft of the master's house, perceptible in the distance, is decorated with an enriched shield, on which the arms of the patron are supposed to be carved." (*Parker's Villa Rustica*, explanation of plates lxv., lxvi., and lxvii.)

Design II.—*Description and Specification, with Details, of Dunchurch Sunday-School.* By F. Wood, Esq., Architect.

This school has been recently erected at Dunchurch, adjoining the churchyard and rectory.

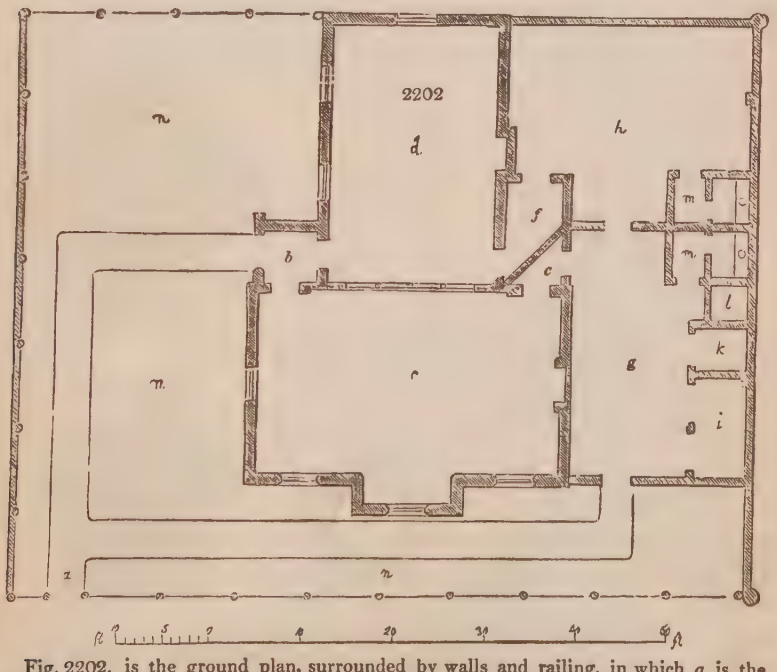


Fig. 2202. is the ground plan, surrounded by walls and railing, in which *a* is the entrance gateway from the churchyard; *b*, entrance porch; *c*, boys' school; *d*, girls' school, separated from the boys' school by folding-doors; *e*, porch to boys' yard; *f* porch to girls' yard; *g*, boys' yard; *h*, girls' yard; *i*, shed; *k*, coals; *l*, dust; *m m*, privies; *n n*, garden, or play-ground.

Fig. 2203. is a perspective view, showing the effect of the north and east elevations. We have omitted some of the elevations and sections, which, though not necessary for understanding the plan and elevation, are yet essential to the parties contracting to execute the work.

2416. *Description.* The design is in a plain Gothic, or modernised old English style; and by reference to the plan, fig. 2202., it will be seen that every essential accommodation is supplied. The site was of rather a peculiar description, being an old moat, and the foundations otherwise bad; consequently, the footings were carried much below the usual depth, and abutments were formed to carry an arch over the moat under the floor of the school-rooms. The description and quality of the materials is given at length in the subjoined particulars, therefore it is only necessary here to describe the engravings.

2417. *Details.* Fig. 2204. shows a plan and elevation of the doors; they are surrounded on one side by splayed bricks, and are six feet high to the springing of the arch.

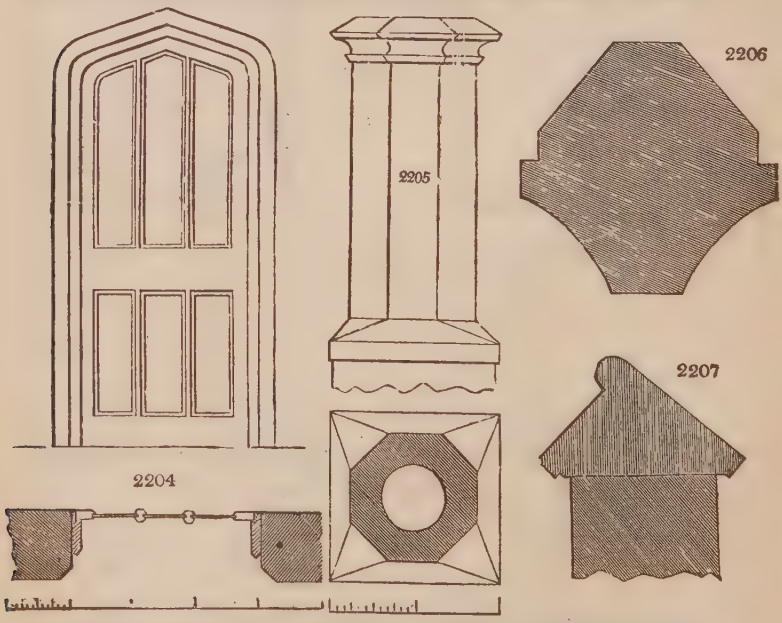


Fig. 2206. is a section of the window centre mullions, one third the full size.

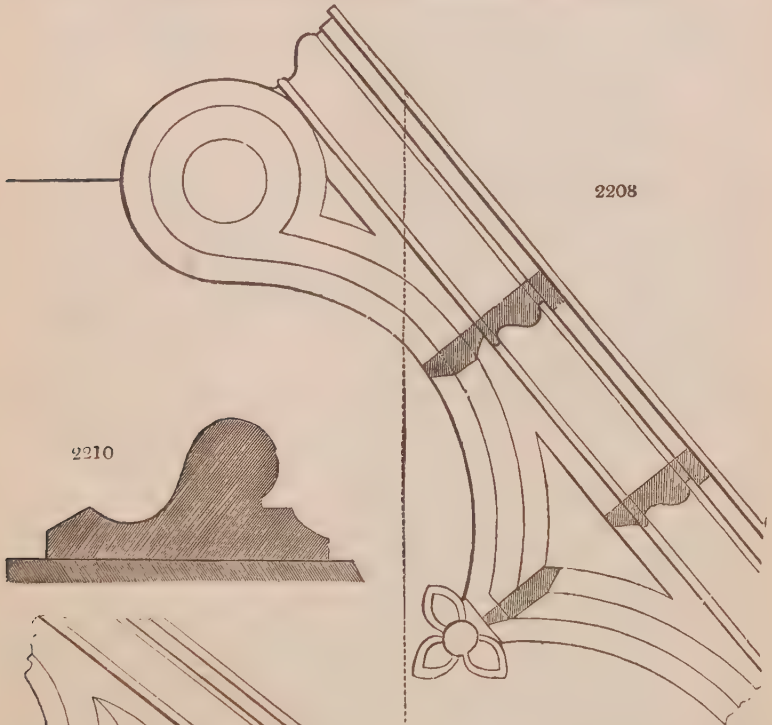
Fig. 2205. shows a plan and elevation of the chimney shafts; the base and cap of which are of stone, and the shaft and plinth rising from the roof of brickwork; the diameter of the flues, nine inches.

Fig. 2207. is a section of the stone coping for parapets, to a scale of an inch to a foot.

Fig. 2208. is an elevation of part of the verge-board of the east, west, and south gables, showing also sections, to a scale of one inch to one foot.

Fig. 2209. is an elevation of part of the verge-board of the north gable, to a scale of one inch to one foot.

Fig. 2210. is a section of the architrave for the doors, one half the full size.



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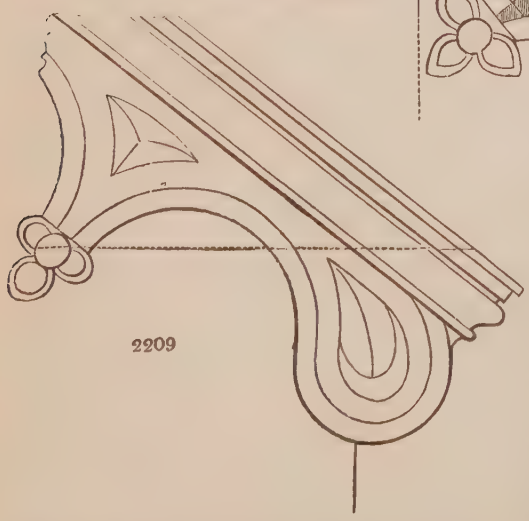

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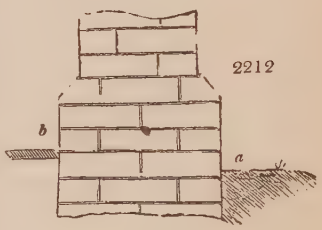
2418. *Specification (or Particulars) of the several Works to be done in Building a Sunday-School at Dunchurch, according to the Plans, Elevations, Sections, and Details, severally signed by the Parties undertaking the same.*

2419. *Excavator's, Bricklayer's, Plasterer's, and Slater's Work.* To dig out the earth for the several trenches and piers, for the foundations of the whole of the building, of the respective depths and widths required, and to fill in and well ram round the work. Raise the ground with good dry gravel, well rammed together, to the height of the several floors, and back up and well cover over the arch over the moat under the girls' school, to a uniform level with the boys' school, ready to receive the floors. Level the ground all round the buildings, and clear away any rubbish that may accumulate during the execution of the work, and leave the same in a clear and perfect manner. Lay drains from the rain-water spouts all round the building, and thence conduct the water into a well on the west side of the building, with a drain tile set with compo on a brick.

laid flat, as in fig. 2211. Build the walls of the several dimensions and thicknesses, and with proper footings, as set forth and described on the plans, sections, &c., with good, sound, and hard, well-burnt bricks, and mortar composed of well-burnt fresh Neobold lime, made up with sand, to be got on the ground or carted to the spot, in the proportions of at least one part lime to two parts sand, and work all the walls above the surface with a neat flat joint, jointed and struck (struck with lines between the bricks, by an instrument called a jointer) on both sides. Lay two courses of eighteen-inch work for the foundations of the main building, and two courses of fourteen-inch work to the walls where nine-inch work is intended above. Set over, fourteen inches below the surface of the ground, two inches and a quarter for a plinth to the main building, on both sides of the walls; the outer side, *a*, to be carried up one foot above the surface to form a plinth, and the inner side, *b*, to be carried nine inches above the floor to form a skirting, both to be neatly jointed, and to finish in again to the fourteen-inch work with proper plinth bricks made for the purpose, with the upper angles taken off, as in fig. 2212. No plinth is requisite for the privy, yard, and mound walls, which are to be carried up with nine-inch work from within six inches of the foundations, the latter consisting of fourteen-inch footings; these walls to be covered with proper coping tiles, made for the purpose. The window jambs and arches to be built and turned on both sides, within and without, with splayed bricks; as also the inner and outer side jambs and arches to all the doors and openings, with projecting bricks round above the arches on the tops of all the window openings, to form a label to be worked in compo, as in fig. 2213. Put a rubbed and gauged fourteen-inch brick arch over the opening in the east porch. The whole of the external walls of the main building to be faced with picked white bricks, and all the piers and chimney shafts to be built octagonal shape, with bricks to be made on purpose, the bases and caps of which to be worked in Attlebury stone (see § 2420., Stonemason). The pediment of the porch on the east side to be carried up six inches above the ramp of the slates, and coped with stone. To pave the porches on the west side, also the privies and shed, with seven-inch square paving quarries, set in mortar and jointed. The school floors and east porch to be laid with nine-inch red and blue Newcastle quarries, bedded and jointed in mortar, and laid diagonally. No part of the walls, while building, to be carried more than four feet above the other, but the whole to be carried up in a regular, uniform, and equal manner. To fix all the wooden bricks and bed all the plates, bond timbers, and lintels in mortar. To cut all the rakes and splays, and all chasings required for lead flashings, and to make good and stop the same with Roman cement; to bed and point the door and window frames in lime and hair, and underpin all the sills. Colour all the internal walls and roofs of a neat drab colour. To cover the whole of the roofs with the best countess slates on $\frac{3}{8}$-inch deal laths, and nailed with copper nails; the ridges to be covered with the blue Newcastle tiles, and the whole to be done with particular care, so as perfectly to exclude the snow, rain, and wind. The fillets, listings, and vergings, to be of Roman cement. The bricklayer to find all materials, ropes, boards, tackle, tools, centres, scaffolding, workmanship, and iron-work for the completion of his work (exclusive of the carriage of the bricks, slates, and quarries only), and to do the whole in the best and most workmanlike manner. To do all the beam-filling and wind-pinning required, and the whole to be done subject to the provisions of the general particulars at the end hereof. The plasterer to lath, lay, float, set, and whiten the ceilings to the porches and privies. The inside of the school walls to be left neatly pointed down in brick, and coloured over with a drab or stone colour.

2211



2212

2213

I, the undersigned, hereby undertake to perform the foregoing bricklayer's, slater's, plasterer's, and excavator's work, for the sum of three hundred and fifty-nine pounds eight shillings and fourpence

(Signed) W. S.

2420. *Stonemason.* To put Yorkshire stone steps and riser to the entrance of the east porch, and to provide and set seven Attlebury stone window-sills, according to the enlarged drawing. To put moulded caps and bases to the two chimney shafts, and two octagonal stone caps to piers; also one date, one shield, and one inscription stone, as in the drawings. To put York stone slabs to cover privy wells, and Attlebury stone coping to the pediment of the east porch, with one projecting stone at gable, and key-stone to the gauged arch in east porch. The contractor to find all materials, workmanship, and carriage, and setting the same in a workmanlike and satisfactory manner.

I, the undersigned, hereby undertake to perform the foregoing stone-masonry, for the sum of seventeen pounds two shillings and one penny.

(Signed) E. A.

2421. *Carpenter and Joiner's Work.* The whole of the materials to be sawed out square, free from waste, and of the several scantlings and thicknesses herein specified; to be carted to the spot by the contractor, and to consist of the best yellow Dantzic or Memel fir. The whole of the carpentry is to be framed in a workmanlike manner, according to the drawings; the carpenter finding labour, nails, and tools, and all kinds of iron-work required for the purpose: the whole to be done subject to the general particulars at the end hereof. To frame and fix a span roof, with four sets of principals, braces, strutts, purlins, rafters, ridge-pieces, gutter-planks, wall-plates, &c., of the several scantlings set forth in the plans and sections. The purlins to be let into the principal rafters, so as to admit of the common rafters lying flush with them on the upper side. All the timbers and scantlings to the internal part of the roof to be neatly wrought and chamfered on the edges, and the principals ornamented with noggings spiked on, and neatly wrought down to form one uniform appearance, according to the section produced. A three-inch diameter staff-bead, neatly wrought, to be put round the internal walls, to hide the intersection of the wall plate with the rafters. The wall-plates to be dove-tailed and bolted together at the angles, with three-quarter-inch bolts, nuts, and screws. Proper lintels to be provided, and put over all the openings for windows and doors, and wood bricks built in, as the building proceeds, for fastening the door-jambs, architraves, &c. Provide and fix four-inch diameter cast-iron spouts round the eaves, supported from every other rafter by a wrought-iron bracket, or holdfast, as shown in the section of eaves, with four upright cast-iron wall-spouts, and heads properly fastened and connected with the spouts, and connecting with a shoe to the drains. — Scantlings of timber. Principal beams, ten inches by eight inches; principal rafters, nine inches by seven inches and by five inches; purlins, six inches by five inches; king-posts, seven inches by five inches; strutts, four inches by five inches; ridge-piece, eight inches by one inch and a half; wall-plates, nine inches by three inches; valley planks, nine inches by two inches and a half; common rafters, three inches by two inches and a half. The lintel over the folding-doors to be ten inches by eight inches, and to have a bearing of at least nine inches at each end, with an inch bolt through the middle, and keyed up to the arch. To put inch yellow deal gutter-boards round all the eaves and chimney-shafts, &c.

2422. *Joiner's Work* to be done according to the several drawings and details. All the stuff to be of the best yellow deal, listed free from sap and shakes; the whole to be neatly wrought and finished off in a workmanlike manner. To put four two-inch paneled doors according to the drawings, with 4½-inch rebated and headed frames, to be built in as the work proceeds. Two one-inch six-paneled doors, made with one fold each, to turn back into the recesses between the two schools, each seven feet six inches wide, by ten feet high (the openings being ten feet by fifteen feet), hung to two-inch rebated jambs headed on edge, and finished round on both sides with an architrave, as shown by the drawings. To put one-inch ledge deal doors and frames with oak sills between the boys' and girls' yard, and in the yard dividing the boys' yard and church-yard. No doors are required for the privies. To frame five window-frames with square heads and chamfered edges, of well seasoned yellow deal, with middle mullions and Gothic heads to oak sills; and two frames with pointed heads, as shown by the drawings: these are to be set and built up with the brickwork. To put 1½-inch well-seasoned yellow deal carved verge-boards, with crown mouldings and chamfered edges, to all the gables, with carved pendants of oak, as expressed by the drawings. To put ¾-inch soffits to all the eaves and gable-hangings, with 1½-inch staff-moulding in the angle against the wall. The carpenter and joiner to find all materials, tools, labour, nails, glue, and every description of ironmongery, locks, bolts, bars, hinges, and fastenings, and the carriage and fixing thereof, and every thing required for the completion of his work in the best and most workmanlike way; and to prepare and fix all manner of beads, stops, fillets, grounds, linings, and backings, required for the perfect execution of the work, whether the same

may or may not be minutely specified in this particular; and the whole to be done subject to the general particular at the end hereof.

I, the undersigned, hereby undertake to perform the foregoing carpenter's and joiner's work for one hundred and ninety pounds thirteen shillings and seven-pence.

(Signed) W. L.

2423. *Plumber, Glazier, and Painter's Work.* To put flashings of milled lead, eight inches wide and five pounds to the foot superficial, chased into the brickwork, and fastened with wall-hooks to each of the chimney-shafts, and where the roofing abuts against the buildings and front parapet of porch. To put milled lead, fifteen inches wide, to all the gutters and valleys. To glaze all the windows with second Newcastle crown-glass in diagonal shape, properly leaded, and neatly pinned at convenient distances to cross-bars of iron; with an iron casement in each window, to swing on a centre, complete with staples, cords, and hooks. Paint all the woodwork, within and without, of a drab colour, twice in oil. To put a lead pump, with pipe and all complete, to the soft-water cistern in the back yard, and leave all the windows, &c., in a perfect and complete state.

I, the undersigned, hereby undertake to perform the foregoing plumber's and painter's work for the sum of thirty-seven pounds ten shillings and three-pence.

(Signed) G. K.

2424. *General Particulars.* The contractors to find all and every kind of material, labour, and workmanship, scaffolding, and carriage, &c. (except such as hath hereinbefore been specified to the contrary), necessary, proper, and requisite for the due execution of all and every part of the works. And if any alteration shall be made in any part thereof, by direction of the employer, during the progress of the works, it shall not vitiate or annul the contract; but the value of such alteration shall be ascertained according to the annexed schedule of prices; and if to such other portion of the work to which the annexed schedule does not refer, then according to the customary prices of the neighbourhood, by the architect, whose decision between the parties shall be final.

The whole of the works must be executed of the best materials of their respective kinds, and in the most substantial and workmanlike manner; and the rooms to be scoured, and the chimneys cored, the windows cleaned, and the whole building left clean and complete on or before the 10th day of October next.

Dated, Rugby, Aug. 5., 1837.
(Signed) Fred. Wood, Architect.

(Signed) W. S.
W. L.
E. A.
G. K.

Recapitulation.

	£	s.	d.
Excavator's, bricklayer's, plasterer's, and slater's work (§ 2419.)	359	8	4
Stone-mason (§ 2420.)	17	2	1
Carpenter and joiner (§ 2421.)	190	13	9
Plumber, painter and glazier (§ 2423.)	37	10	3
Actual cost	604	14	3

2425. *Remarks.* The architect's fees are not included in the above sum. In moderate foundations the above estimate would be less 70*l.* at least, the site of this school being peculiarly situated over an old moat, the foundations consequently were bad, and had to be laid at a great depth, and arched over, as expressed in the section of the foundations.

Schedule referred to.

	s.	d.	
Nine inches reduced brickwork	4	6	per yard super.
Paving with seven-inch red quarries	3	0	do.
Do. do. nine-inch red and blue Newcastle quarries	4	4	do.
Tile drain on brick flat set in compo	0	6	per yard run.
Coping to nine-inch walls, with tiles	0	2	per do. do.
Ridge coping with Newcastle tiles	0	10	per foot
Lath and plaster to ceilings	1	6	per yard
Stucco on walls	1	1	do.
Countess slating on long ⅝-inch laths and copper nails	36	0	per square
Paving with brick flat	1	10	per yard.

Design III.—*A Union Workhouse.* By C. Eales, Esq., Architect.

2426. *Description.* This design was prepared and submitted to the guardians of the Horncastle Union, Lincolnshire, in the early part of the last year, for their proposed workhouse, in accordance with the terms of an advertisement which appeared in the daily papers; viz. to accommodate two hundred inmates; the expense not to exceed £2,800. The drawings (figs. 2214. to 2218.) are accurately reduced from those sent in, which, however, were not adopted.

Fig. 2214. is the elevation of the principal front of the main building.

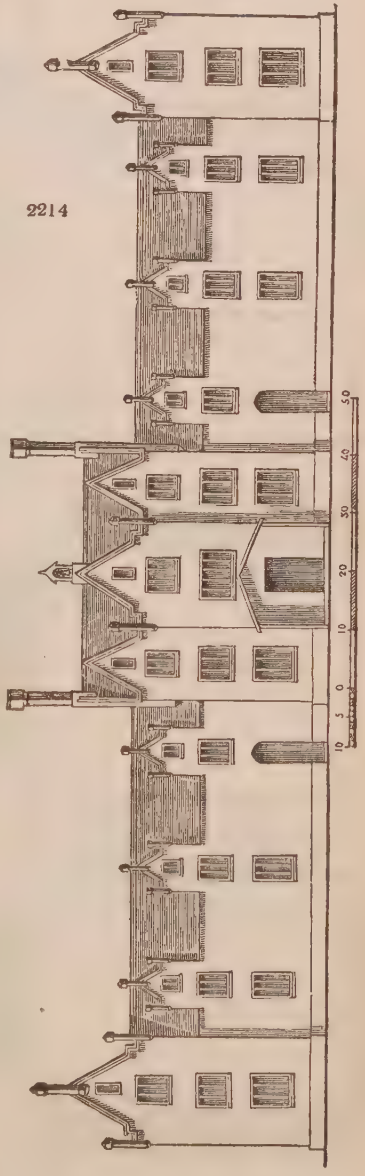
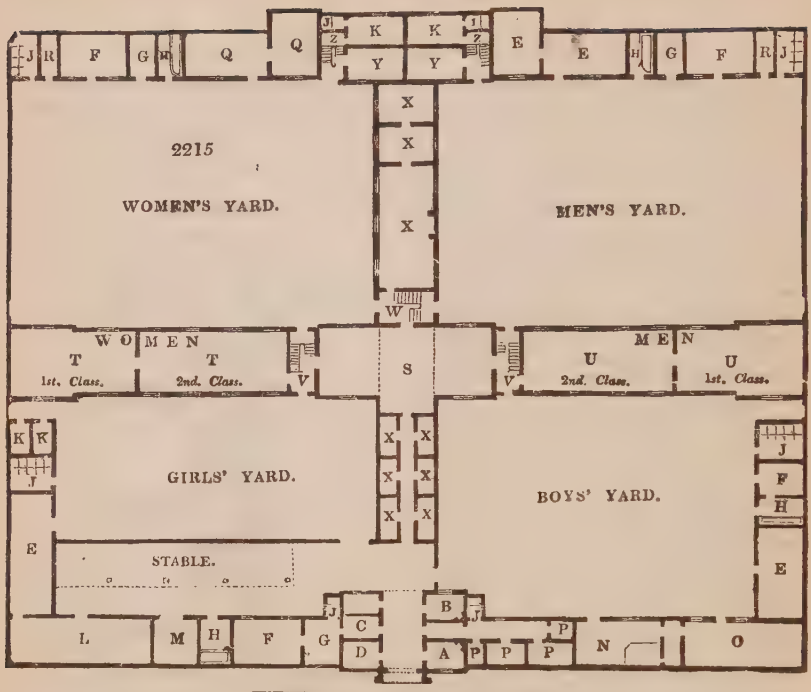
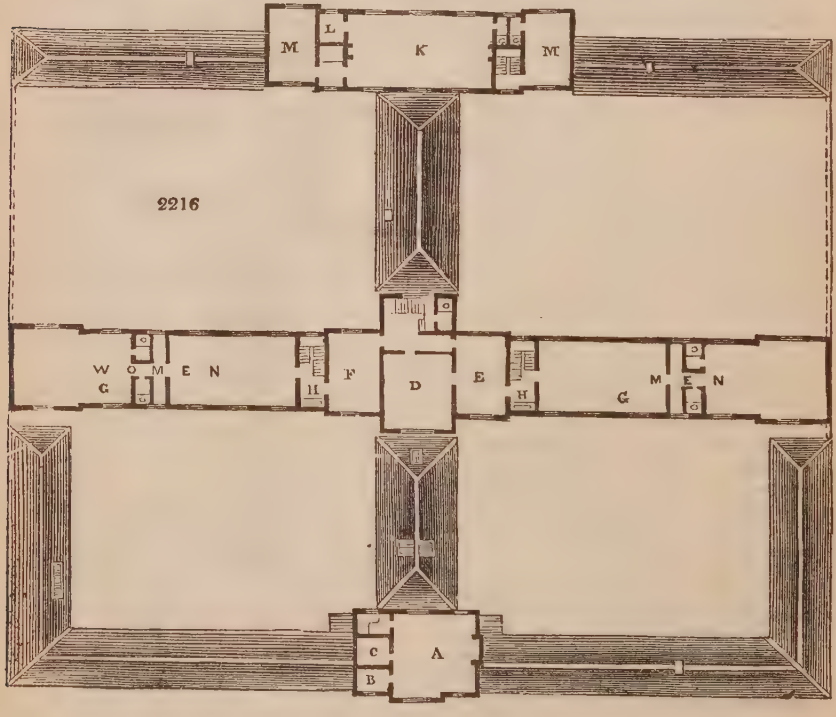
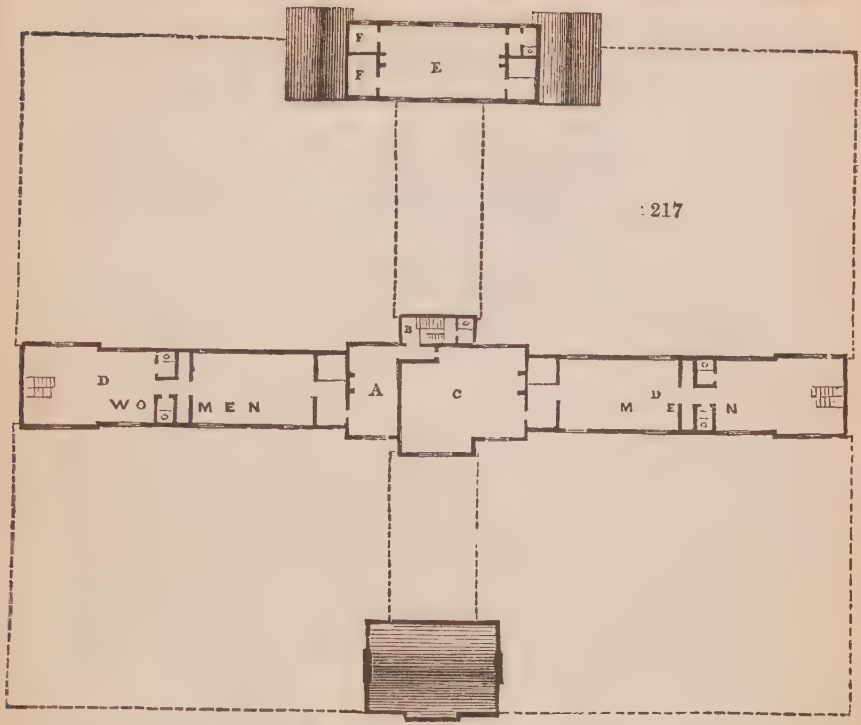


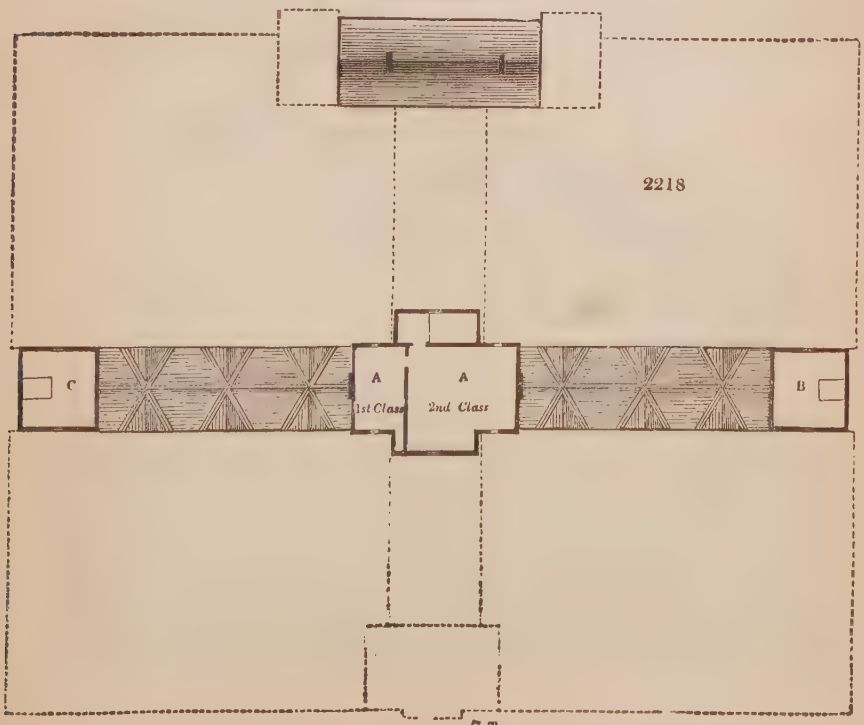
Fig. 2215. ground plan of the workhouse. The first building, forming the gate-house, is two stories in height, and comprises on this plan every convenience for the officers of the establishment; viz. *a*, porter's room; *b*, relieving office; *c*, waiting-room for the poor; *d*, searching-room, together with a staircase leading to the board-room on the story above. A water-closet for the use of the guardians is intended under these stairs. Right and left of this building are the various offices and receiving wards for the use of the girls and boys, women and men's wards, and general purposes; E, work-rooms; F, receiving wards; G, baths; H, washing-rooms, fitted up with troughs; I, privies; K, refractory cells; L, coal-house; M, wood-house; N, bakehouse; O, flour and mill room; P, bread and potato stores; Q, laundry; R, ashes. The main building upon this plan comprises, S, chapel. It is proposed, as the service will be attended by the inmates on the sabbath only, that during the week it should be appropriated for the purpose of the girls' and boys' school and dining-rooms, which could be conveniently done by movable partitions on the dotted lines, at the same time reserving ample space for the performance of daily worship should it be necessary. On either side of the chapel, T and U are women's and men's dining-rooms, classified, each of which have staircases, V, conducting to the dormitories on the stories above; W, staircase to master's and mistress's rooms, each of which have separate access to their respective departments; X, store-rooms, kitchen, scullery, and larder. Considering it most essential, in an establishment of this nature, to keep the sick in as isolated a situation as possible, particularly in case of an epidemic or contagious fever, the building containing the infirmary has been placed at the back of the premises, forming a separate structure, and contains, on this plan, Y, dead-house for each sex; Z, staircases for men and women to infirmary, &c.

Fig. 2216. Plan of the first Story. The gate-house comprises a spacious board-room, A; clerk's office, B; strong room, C. In the main buildings, D is the master's bed-room; E, master's parlour; F, mistress's parlour; G, women's and men's dormitories, classified, each of which have


2215
WOMEN'S YARD.
MEN'S YARD.
WOMEN
1st. Class.
2nd. Class.
MEN
2nd. Class.
1st. Class.
GIRLS' YARD.
BOYS' YARD.
STABLE.


2216
WOMEN
MEN


F
F
E
217
B
D
WO
MEN
A
C
MEN
N


2218
C
A
1st Class
A
2nd Class
B

staircases, H, conducting to the dormitories on the stories above. Two water-closets and washing-troughs are provided in each dormitory. I, staircase and water-closet for master's apartments; K, women's ward, and women's sick and lying-in ward; L, surgery; M, wards for the insane of each sex, with separate staircases and water-closets.

Fig. 2217. Plan of second Story. The main building comprises, A, mistress's bedroom; B, staircase and water-closet; C, boys' first class dormitory; D, women's and men's dormitories, classified, as in the story beneath. In the wings are staircases communicating with the story above; E, men's sick ward, with separate staircase, water-closet, and washing-trough: F, nurses' rooms.

Fig. 2216. Plan of third Story: the main building. A, girls' bedrooms, classified; B, boys' second class dormitory; C, nursery.

Summary of Accommodation.

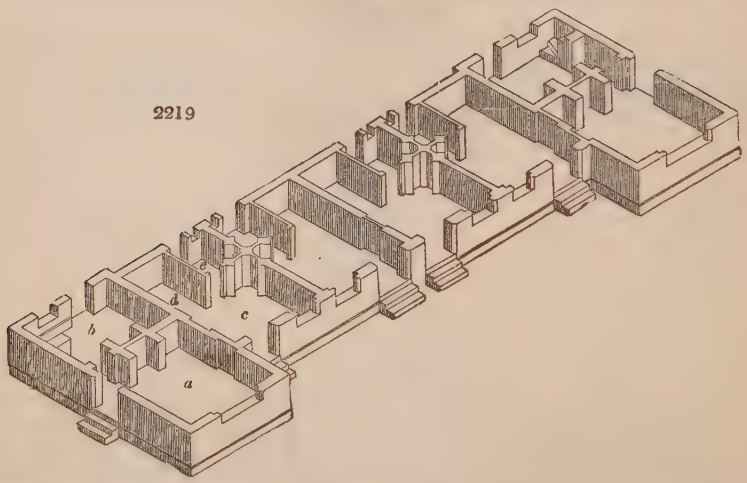
	1st Pair.	2d Pair.	3d Pair.	Total.
Men	40	40	—	80
Women	40	40	—	80
Boys	—	14	12	26
Girls	—	—	30	30
				216

Design IV.—*The Almshouses at Oving.* By John Elliott, Esq., Architect.

The elevation is shown in perspective in fig. 2220., and the ground plan in fig. 2219. This plan is shown in isometrical perspective with the walls raised the height of four feet, a mode which renders plans much more easily understood, and consequently more interesting than the ordinary mode.

2427. *Accommodation.* The dwellings at the two ends of this line of building are larger than the others, and consist of a living-room, twelve feet by fourteen feet, *a*; scullery, twelve feet by ten feet, which contains a stair to two bed-rooms, *b*. The other dwellings, of which there are four, are smaller, and each of them consists of a living-

2219



room, twelve feet by ten feet, *c*; a bed-room, six feet by seven feet, *d*; and a scullery, five feet six inches by six feet six inches, in which there is a stair to two small bed-rooms over, *e*. Behind each dwelling is a small garden; and there is also in front a narrow slip of ground, neatly laid out and planted with shrubs and flowers. The situation is on a bank or ridge along the public road, and separated from it by a small watercourse. The cost of these six dwellings was about £650.

2428. *Remarks.* These almshouses were built for Miss Woods of Shopwyke, the proprietress of the village of Oving, near Chichester. This village she has greatly improved, by rebuilding most of the cottages from designs by Mr. Elliott, adding large gardens to them, and charging a rent for each cottage which does not pay more than between 2 and 3 per cent on the capital employed. The church of Oving has also been repaired

2220

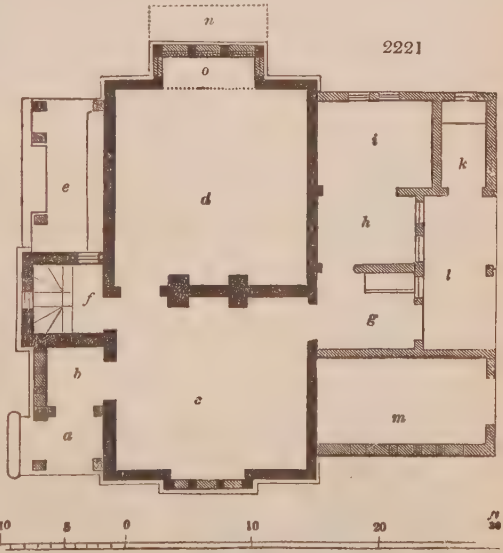
and restored by Miss Woods; and the churchyard we have noticed in the *Gardener's Magazine* for 1841, p. 591., as reformed in the very best taste, under the care of the rector, the Rev. G. H. Langdon. Miss Woods has also built a commodious school at Oving, from the designs of Mr. Elliott, which, like all that gentleman's designs that we have seen (and they are numerous), is in excellent taste. We regret much that time and space prevent us from taking advantage of Mr. Elliott's kindness in offering us the use of any of his designs for publication in this Supplement.

Design V.—*A Public-house.* By I. W. Wild, Esq., Architect.

The elevation is shown in fig. 2222., and the ground plan in fig. 2221.

2429. *Accommodation.* The plan shows a porch, *a*; lobby, *b*; kitchen, *c*; parlour, *d*, with a bay, *o*, which may be separated in the winter season by a screen of glass, so as to form a small greenhouse; an open veranda, *e*, with seats for smoking and drinking, the liquor being served out through the small window shown at the bottom of the staircase; *f*, the staircase, over which there is a pigeon-house, and from which the sign is projected; *g* is the back-kitchen; *h*, the pantry; *i*, the dairy; *k*, water-closet; *l*, open porch; *m*, cow-house; and *n*, dotted lines, showing in what manner the bay of the parlour may be extended, so as to afford a larger space when partitioned off as a greenhouse.

2221



2430. *General Estimate.* The cubic contents are 18,583 feet; which, at 6*d*., amounts to £464 14*s*. 6*d*.; at 4*d*., to £309 14*s*. 3*d*.; and at 3*d*., to £232 7*s*. 3*d*.

2431. *Remarks.* The walls of this cottage are supposed to be covered with stucco between the principal timbers of their construction; thus being divided into panels, which, again, may be ornamented with patterns stamped by plates of wickerwork upon the stucco while yet moist. The impression would resemble interlacing basket-work, according to the disposition of the wicker, of which there may be many beautiful patterns. Some of the panels might be ornamented with initial letters, appropriate devices, foliage, &c., easily executed and of good effect; as in ancient plastered houses in many parts of this country. Perhaps the most beautiful example in the world, of

2222

elaborate ornament in stucco-work, is the Moorish palace of the Alhambra in Granada. In this building there is an endless variety of patterns, many of them so complicated as to have three planes of ornament, one overlying the other, yet each perfectly distinct; others, again, are simply formed by the intersection of geometrical patterns, in lines slightly engraven in the stucco. This building, so elaborately illustrated by Owen Jones, is a complete encyclopædia of ornament, and deserves especial attention when the subject of enriched stucco is considered. The practice of covering walls with cements has been condemned by some architectural writers, but upon insufficient grounds. The material, particularly, is of the greatest value, as it enables us to make a thin wall more weather-proof than one much thicker and more costly without it. When used externally it should be protected by projecting eaves.

Design VI. — *The Hand and Spear Hotel, at Weybridge, Surrey.*

2432. A perspective view of this very picturesque hotel is shown in fig. 2223. We have not given the plan, because there is nothing remarkable or characteristic in the arrange-

2223

ment; in short, it is merely an old public-house with some additional rooms. The whole, however, is commodious and comfortable. The elevation, as it appears in the figure, was designed by the Honourable Peter John Lock King, the proprietor of the estate on which the inn is built, who, with his brother, the Earl of Lovelace, appears to inherit a taste for architecture from their ancestor, Mr. Lock of Norbury Park, in Surrey. (See Gilpin's *Cumberland.*) The view shows the inn as seen from the Southampton Railroad.

CHAP. V.

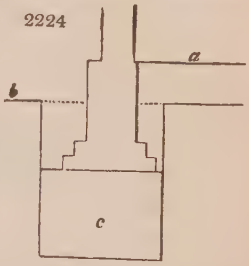
Details of Construction applicable to Cottages, Farm Buildings, Villas, &c.

As many of these details are alike applicable to several classes of buildings, we have, for more convenient reference, brought them all together. We shall begin with foundations, and take, in succession, walls, roofs, interior arrangements, and miscellaneous matters.

Sect. I. *Foundations and Walls.*

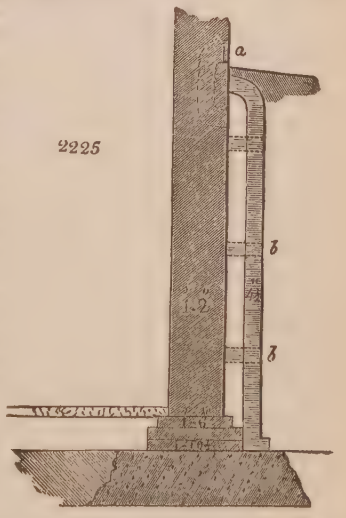
2433. *Concrete.* The use of this mixture of lime, gravel, and sand, in foundations, and for floors of sheds, and even of cottage dwellings, is now very general. In using it in the foundations of a house, a trench is dug out about eight inches wider than the lowest course of brickwork or masonry, and to such a depth as is necessary to arrive at firm soil. This is shown in fig. 2224., in which *a* is the floor line; *b*, the ground line; and *c*, the concrete. When the trench is made, coarse and fine gravel are thrown into it, just as they come from the pit, to the thickness of about four inches; it is then grouted with thin hot lime, just enough to bind the gravel together, and afterwards rammed quite hard. Course after course must then be laid, and so treated till the mass reaches within about eighteen inches of the ground line. The proportion of hot lime to the gravel is about one eighth part only. Others use lime in the proportion of one to five of loamy gravel. In countries where gravel is not common, dry brick rubbish, broken stone, flints, or any material that will bind into one mass, will answer. Carter informs us that the foundations of Westminster Abbey, erected in 1245, consist of flints, irregular stones, rubble, and mortar, forming an almost impenetrable body. In many of the ancient castles, particularly in Kent, the foundations are thus made. (*Arch. Mag.*, i. 248.)

2224

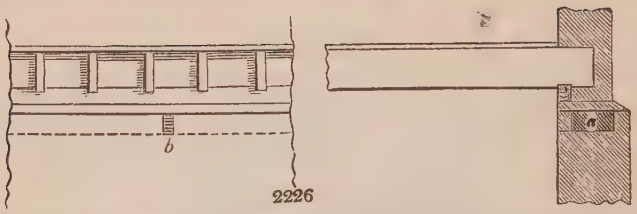


2434. *Preventing Dampness in Foundation Walls.* Fig. 2225. represents the section of a wall built on a concrete foundation, *c*, formed within a trench, the sides of which are pared down inwards, so as slightly to increase the base. Around all the walls of the foundation against which ground will lie a dry area should be formed, in order to prevent dampness within the building This may be done with a half-brick wall, placed at a little distance from the part to be protected, as represented by the annexed sketch. The space thus enclosed must be arched over at the top, just below the level of the ground; and if iron air-bricks, or small gratings communicating with the dry area, be introduced, wherever open areas are formed, around windows or elsewhere, a free circulation of air will be obtained. Should no open areas occur in the basement story, small flues, or throats, may be formed at certain intervals within the wall, terminating just above the ground, to receive an air-brick, as shown at *a* in the figure. The wall of the dry area, although under ground, should not be carelessly executed, as it must necessarily be subjected to considerable pressure, and the workmen should be directed to put in whole headers at certain distances, that is, bricks placed lengthwise in the direction of the thickness of the wall, as at *b b*, so as to stiffen it.

2225



2435. *To prevent Damp from rising in Walls*, a vacuity may be left in the centre of the wall just above the surface of the ground as at *a*, in fig. 2226., laying over it slabs of stone or slate, chamfered off so as to form a neat finish to the plinth round the outside of the building. At various intervals, small openings, communicating between this channel and the interior of the building, should be made as at *b*, so that a current of air may be driven through the vacuity and openings under the floors, in order to ventilate them. (*A. M.*, i. 233.)



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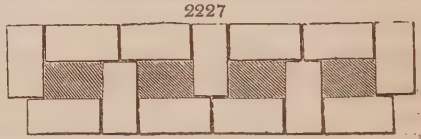
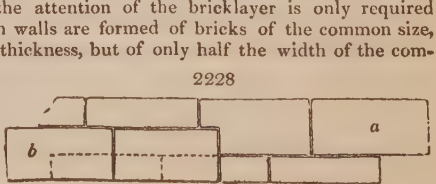
2436. *To prevent Damp from ascending the Walls of a House already built,* introduce a water-proof medium through the wall, just above the level of the ground, in the following manner: First, make a hole through the wall, over the ground course, taking out two courses in height, and two bricks in length; consequently, the hole will be six inches high and eighteen inches wide. Then fill up half this hole, at one end, with two courses of sound bricks, laid in Roman cement. It is clear that the operation could not injure the wall, the width of eighteen inches not allowing of any settlement. Two courses more, of nine inches in width, are next removed, making the hole again eighteen inches wide; the half of which is then filled up with bricks and cement as before. The operation is to be repeated until the whole of the walls of the house are underpinned by two courses of hard bricks and three joints of Roman cement; constituting a water-proof septum, through which the damp cannot rise. (*A. M.*, i. 123.)

2437. *Brick Walls.* In addition to the various modes of building hollow walls shown in the *Encyclopædia*, we give the following mode of building a wall fourteen inches in thickness, with only a small additional quantity of bricks to what are required for a nine-inch wall. Fig. 2227. shows the plan, or first course of bricks, of such a wall, and all the rest is mere repetition. Walls built in this manner may be carried to the height of ten or twelve feet, without any piers, and hence they are suitable both for the walls of cottages and gardens. For the latter purpose two courses of cross bond may be left out, on a level with the surface of the ground, in order to leave room for a hot-water pipe, which, in consequence of the vertical vacuities, will heat the whole wall. If we suppose that only half the amount of cross bond is used, then the saving of bricks will be still greater. A rod of solid nine-inch brickwork requires 4,500 bricks; a rod of hollow fourteen-inch brickwork, such as fig. 2227., requires 3,600 bricks; and a rod with only half the amount of cross bond shown in fig. 2227. requires 3,200 bricks. If the whole of the brickwork were set on edge, then, for a common nine-inch wall, hollow, the number of bricks required per rod will be 3,000; for a fourteen-inch wall, hollow, on the principle of fig. 2225., but with bricks on edge, the number required per rod will be about 2,800; and for a wall, brick on edge, with only half the cross bond shown in fig. 2227., the number per rod required will be about 2,500.


2227

2438. It is evident that hollow walls might be made eighteen inches or two feet in thickness, either with brick in bed or brick edgewise, on the same principle as fig. 2227.; and if such walls were filled in with concrete, they would form excellent walls for cottages. When cottage walls are built hollow, it is necessary to have solid piers to the doors, and to have a space carried up solid from the foundation to each window, the jambs of which, like those of the doors, must of course be carried up solid. In brick-on-edge work the solid parts must still be built with all the bricks set on edge, but no bricklayer will find any difficulty in effecting this object.

2439. *Brick Walls, seven inches and a half thick,* and fair or smooth on both sides, are convenient, not only for partitions, but even for the outside walls of sheds and other buildings, and for garden walls. A common nine-inch wall, as every reader of any experience in building knows, can only be built fair on one side, unless built hollow, as in the one in the preceding paragraph, but $7\frac{1}{2}$-inch walls having no bricks which pass right through the wall, the attention of the bricklayer is only required to one side at a time. These $7\frac{1}{2}$-inch walls are formed of bricks of the common size, and of bricks of the same length and thickness, but of only half the width of the common bricks, by which means they can be "worked fair" on both sides. These are laid side by side, as in fig. 2228.; in which *a* represents the first course, and *b* the second course. The bond, or tying together of both



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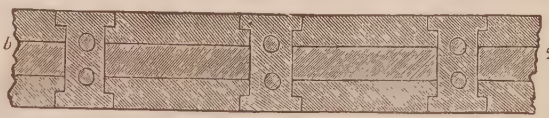
sides of the wall, is not obtained by laying bricks across (technically, headers), but by the full-breadth bricks covering half the breadth of the broad bricks, when laid over the narrow ones, as shown at *b*, and in the vertical section, fig. 2229. Besides the advantage of being built fair on both sides, *there being no headers, or through and through bricks*, in these walls, the rain, when they are used as outside walls, is never conducted through them, and the inside of the wall is consequently drier than the inside of a wall nine inches in thickness. These walls are adapted for a variety of purposes in house-building and gardening. The only drawback that we know against them is, that the narrow, or half-breadth, bricks must be made on purpose.

2229

2440. *Hitch's Patent Rebated Brickwork.* The bricks are much larger than usual, and the walls are said to be stronger, and twenty per cent cheaper. Some walls and buildings at Brompton have been executed with them under the direction of Mr. Godwin, but they are far from being generally known. Fig. 2230. represents a longitudinal section of a nine-inch header, and fig. 2231. part of one course of nine-inch work. From this it will be seen,

2230



2231

that the headers and stretchers are rebated together, and form two external faces of brick-work enclosing a hollow space, or series of hollow spaces. Each of the headers has two dowel-holes through it, in the direction of its height, and is hollowed out on the under side as shown in fig. 2230.; so that these spaces communicate with one another, by means of the dowel-holes, throughout the whole extent of the wall. Now, into these chambers, as each course is laid, a concrete, properly compounded of gravel and lime, is introduced; and the whole, when finished, is thus rendered a solid and well-combined mass.

The appearance presented by walls built in this manner is uniform and bold (each brick being five inches high, and proportionally long): very little mortar is required for laying the bricks; so that, if affected by frost, the work may be repaired at small cost. Again, the importance of giving to the bricks the perfect shape of the mould entails the necessity of previously well kneading the clay, and, when moulded, the form of the brick allows full effect to the fire while burning; so that, in composition also, these are generally superior to common bricks: and, notwithstanding all these supposed advantages, brickwork can be executed in this manner twenty per cent cheaper than by the ordinary method. A variety of other bricks, besides those we have mentioned, are used in this system of construction, such as bat-headers, closers, reveal-headers, and angle-headers; and this slight complexity seems to be the chief objection to its general adoption, as common workmen are unable to execute it without some little previous instruction on the subject. In thick walls, for the interior of which the patentee uses what he calls a "clenched core-brick," to tie the whole together, and prevent the walls from splitting, almost any degree of strength may be attained; and here, inasmuch as a greater proportion of concrete is employed, a much larger saving than that mentioned above may be effected; probably as much, in some cases, as 40 per cent. For arches, Mr. Hitch has made wedge-shaped bricks of various radius, by means of which the larger mortar joint occurring when common bricks are employed for this purpose is avoided; and ordinary vaults may thus be formed of five-inch "arch bricks," having over them a thin layer of concrete, for about 5*s.* per yard superficial. Several small bridges have been successfully built with them. For garden walls, bricks are especially made with merely two dowel-holes in them; so that iron rods or oaken stakes may be passed through, thus stringing them together, the interstices being filled up with concrete. Fig. 2233. shows the plan of one of these bricks; and fig. 2232. exhibits a section of garden walling constructed with them, under Mr. Godwin's direction, in several places. A footing of concrete, about twelve inches in thickness, is first thrown in. Upon this is laid one course of nine-inch work, and one course of splayed bricks, made for the

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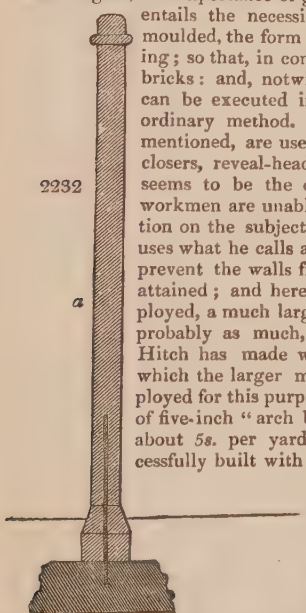

2233

purpose, from which commences the six-inch walling of doweled bricks, terminating with a bead-brick and coping of the same material, set in cement. At certain intervals angular piers are formed, to strengthen the wall; and iron rods, as before mentioned, are introduced in various places. One of the latter is shown in the engraving, passed through the bottom courses into the concrete. The cost of a wall thus constructed, with six-inch bricks, including the coping and piers, but exclusive of the concrete footing, is about 5*s.* per yard (being little more than the price of wooden fencing, which constantly requires repairs, and is, therefore, a continual source of expense); and a similar wall may be built with four-inch bricks for 4*s.* per yard. For horticultural purposes the patentee has occasionally glazed the face of his bricks: this is the case with a garden wall in the garden at Hampton Court Palace, built by him several years ago. (*Arch. Mag.*, vol. i. p. 581.)

2441. *Hitch's Brick Drain*, for which he has a patent, is of simple but excellent construction, of which fig. 2235. represents a section. Each brick is about thirteen inches long, segmental, and wedge-shaped; and is rebated at the ends (as shown by fig. 2234., which is a longitudinal section of a single brick), so as to fit together accurately without much cement. On the top of each two indentions are formed, in order to lessen the quantity of earth required for making them, and afford a handle to the workmen. Four bricks form a nine-inch drain, as represented by the sketch, which can be executed complete for 11½*d.* per foot running; and six of them, having a slightly different radius, make a twelve-inch drain, costing 1*s.* 4½*d.* per foot: in both cases exclusive of digging. The bricks themselves cost about 17*s.* per hundred, and the amount of labour and cement required is very small.

2234

2235

2442. *Bricks may now be made of ornamental Forms*, or coloured, on payment of double duty, which it is to be hoped may lead to the revival of brick cornices, architraves, &c., such as were in use till ornamental bricks were heavily taxed. The fine effect of coloured bricks is admirably shown in the Lombardo-Venetian church, recently built from the design of Mr. Wild, at Streatham. How the colouring of bricks is effected in the manufacture has been shown by John Dobson, Esq., in the *Proceedings of the British Association* for 1838.

2443. *Building Cottage Walls of Clay Lumps.* John Curtis, Esq., of Rougham, informed us that he had built cottages, barns, and farm-yard walls, with what are called clay lumps. They are, he says, more durable than any thing except stone, very dry, and from 600 to 700 per cent cheaper than bricks. "I have built the walls of a farm-yard one foot thick with clay lumps; and, when at the desired height, made a coping for it of a frame-work of boards one inch and a half thick, and six inches wide. These, nailed together with cross pieces at every four or five feet's distance, are laid on the top of the wall, which thus forms the eaves, by projecting two inches on each side of the wall; the outer edges of the boards being beveled or sloped off to facilitate the drip of the water from the wall, similarly to a drip brick. The coping is then finished by covering it with worked clay, in the state that it is when ready for making lumps. This, with a little occasional repairs, will last for many years."

2444. *To make Clay Lumps.* Three loads of soft tender clay, which should be yellow, not blue, the latter being too strong, will make one hundred lumps; which, when dry, will weigh six stones, of fourteen pounds each. The three loads should be put into a heap, all large stones being carefully picked out, and soaked with as much water as the mass will absorb; then tread it with one or two horses, and, as it is trodden, mix as much short old straw as can properly be mixed with it, by adding more water as may be required. The edges of the mass should be turned into the middle of the heap from time to time; and the horses should be kept treading it till all the clay is thoroughly broken, and mixed so as to become like stiff mortar. All the secret depends on well mixing the clay with plenty of straw. It should not be made too thin. As soon as this quantity is properly prepared, men should be making it into lumps, which is done by putting sufficient clay into a mould of wood, of the following dimensions: eighteen inches long, twelve inches wide, and six inches deep, no bottom. The mould, when well filled, by the men putting in the clay with a spade, and pressing it with the foot, the top being smoothed with the back of the spade, should be lifted up, and the lump will then be left perfect. Wet the mould with a wisp of oat straw, to prevent the clay hanging to it, and place the mould about two inches from the first lump, and fill as before; then wet the mould and place it about two inches off, and proceed as before. This filling of the mould is best done on level grass ground. As soon as the lumps get a little stiff, that is, just enough to admit of handling them, they should be set on one edge, and as they dry be turned; and in doing this, place the wet side to the sun. The

rough edges must be trimmed with a spade, or any edged tool, as they become dry enough to be haled (that is, built up in rows about three feet high, one brick wide, and the lumps one or two inches apart at the ends, as new-made bricks are before they are burned), so as that the wind can pass between each lump. Winter is the best time to get the clay into heaps, that the frost may pulverise and mellow it. In March, as soon as the severe frosts are over, begin to work the clay and make the lumps, and, if the weather is favourable, they will be fit to build with in three weeks or a month.

2445. *To build a Cottage, Barn, or any Building, with Clay Lumps*, the foundation must be good; that is, built with brick or stone at least eighteen inches above the surface of the ground. The larger the building, the higher the foundation should be; say three feet; and it should be two inches wider than the lumps, so that one inch of plaster may be put on each side of the wall; the width of the walls being according to the size of the building. Of course lumps can be made to any size, according to the building intended. The expense of building the walls (which are eighteen inches thick) is 6*d.* per yard; and 1*d.* per yard, covering each side of the wall with cement, which is only common clay mixed well with very short straw, being very particular in picking out every stone, and treading it more than usual. Let it lie in the heap till the autumn, and then (in October) apply it to the walls as a coat of plaster is applied to any common wall. — *J. C. Feb.* 3. 1842.

The only objection that we see to these walls is, that they do not appear to admit of finishing with common lime plaster within; but on writing to Mr. Curtis on the subject, he informed us that he had no doubt lime plaster will adhere equally well with plaster of clay. It does so in the pisé walls of France.

Sect. II. *Roofs and Floors.*

2446. *Terrace Roofs* have of late years become very general in and about London. They are formed of thin arches of tiles and cement, supported on cast-iron bearers or ribs, which are placed about three feet apart. The arch is composed of three courses of common plain tiles, bedded in fine cement without sand. In laying the tiles, laths or small slips of wood are used, resting on temporary bearers between the iron ribs; the laths being shifted as the work advances, in the course of about half an hour after the tiles are laid. Particular attention is required to bonding the tiles both ways; and they are rubbed down closely upon each other, much in the same manner as a joiner glues a joint. Mr. Fowler covered a wing of his house with a roof of this kind, over which he laid a bed of coarse gravel, and on that nine inches of soil, so as to form a terrace-garden: he also covered the roofs of two taverns in Hungerford Market in this manner, and found it a more agreeable surface for walking on than lead, both as to texture, and from being a non-conductor of heat. Where a covering or roof of tiles and cement is not intended to be walked on, two courses of tiles are considered sufficient; but where it is liable to be loaded by persons standing on it in crowds, three courses should be used. Two courses of tiles on iron joists amount to one third less expense than covering with "eight-pound lead" and fir joists. (*Trans. Inst. Brit. Arch.*, vol. i. p. 48.) This covering has the advantage over one of asphalte, in not being liable to be softened by the heat of the sun; but asphalte, being much lighter, may be laid on wooden joists, covered with boards, in the same manner as if lead were to be used.

2447. *Asphalte* is one of the most remarkable introductions for building purposes which has taken place since the publication of the Encyclopædia. Asphalte had been in use in France for many years, but was comparatively neglected there till the stimulus given to improvement by the Revolution of 1830. It is now in very general use in France for foot-pavements, flat roofs, and lining water-cisterns; and in England it has also been a good deal used for the same purposes, and for flooring to barns. We are not aware that it has been used as flooring for cottages, but we know of no objection to it, at least for rooms on the ground floor in which there are no fireplaces. Asphalte is found in a natural state in the Obsaun and other parts of France; but it may be formed artificially in every respect equally good, and in England much cheaper. A very good recipe is: eighteen parts of mineral pitch, and eighteen of resin, put in an iron pot, and boiled for a little; after which, sixty parts of sand, thirty of small gravel, and six of slacked lime, are to be added. The foundation being rendered dry, and being brought to a level with gravel or small stones, the mixture is taken out of the pot, or caldron, in which it was boiled, with an iron shovel, in a boiling state, and spread evenly over the prepared surface about the thickness of two inches for ordinary pavements, and about a third part thicker for barn floors and flat roofs. According to Dr. Ure, boiled coal-tar, mixed with powdered chalk or bricks, will make as good asphalte as the natural kind. (*Dict. of Arts, &c.*, Bitumen.)

2448. *Pocock's flexible Asphalte Roofing* is intended to supersede the use of slates, tiles, zinc, thatch, &c., in the covering and lining of farm buildings, sheds, cottages, and other

erections; and, from its durability, lightness, and economy, it is in very general use. The weight of this manufacture being only sixty pounds to the square of one hundred feet, the walls and timbers to support it are required to be but half the usual substance; it is also a non-conductor of heat, impervious to damp, and will bear a heat of two hundred and twenty degrees without injury. Several architects and railway engineers have already adopted the asphalte roofing for sheds and other buildings; it has also been used instead of mats or boards for covering glass frames in gardens. The materials of which this roofing is composed are the refuse felt of hatters, and natural or artificial asphalte, mixed together and compressed into thin plates.

2449. *The new French Roofing Tiles* (fig. 2236.) were introduced from Paris by Sir John Robison in 1840. These tiles are square in form, about nine inches or ten inches

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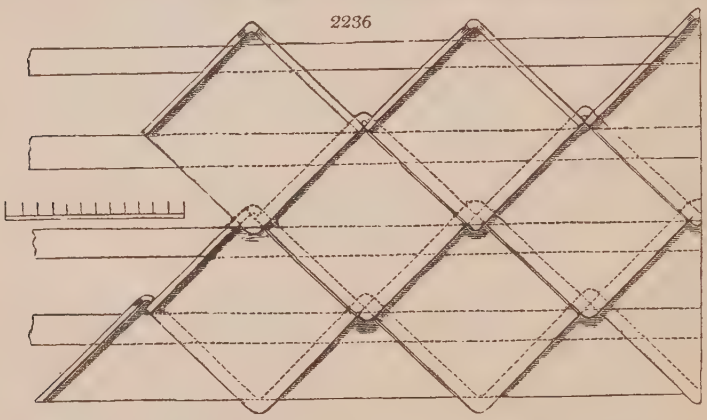
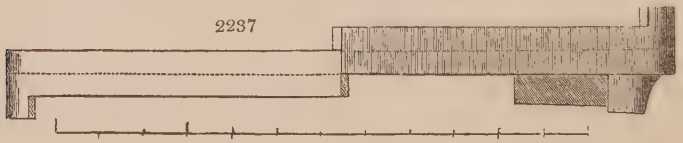


on the side, with a raised ledge on two sides. They may be either laid with or without mortar or cement, but they are better with a little, by which they effectually exclude water. The boundary lines of the tiles being all diagonal, the rain-water tends to run to the lower points (instead of hanging in the joints by capillary attraction), where the nosing on the lower angle of the tile, shown in the section (fig. 2237.), conducts the

2237

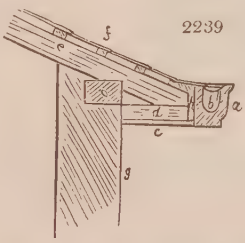


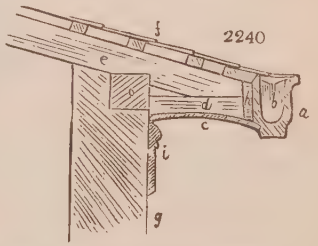
stream or drops, on to the flat part of the next tile below it. To finish the roof at the ridge half tiles are placed there, analogous to those placed at the eaves, but having a raised ledge along their upper edge, over which edge a peculiarly shaped ridge-tile is inverted to complete the whole. These tiles are lighter than pantiles, in the proportion of sixty-eight pounds to one hundred and ten pounds per square yard, which is the usual weight. The general aspect of roofs covered with them is agreeable, and the cost will be evidently much less than that of any description of tile roof at present in use. The Highland Society is endeavouring to introduce the tiles into Scotland, and we have sent drawings of them to Mr. Varden, at Worcester; Mr. Elliott, at Chichester; and Mr. Wilds, at Hertford.

2450. *Cubitt's Improvements in Roofing* are of a very ingenious character, and though confessedly not adapted to first-rate or other houses requiring roofing of a permanent and perfectly weather-tight description, will be found, nevertheless, of very extensive application. Wherever quickness of construction, lightness, and cheapness are objects of importance, and no more is cared for than protection overhead during ordinary states of the weather, as in the case of colonnades, verandas, penthouses, drying-houses, tool-houses, summer-houses in gardens, boat-houses, workmen's sheds, railway stations, &c., these improvements will be found of great applicability and value. (*Mech. Mag.*, vol. xxxiii. p. 210.) It would occupy too much space to describe this mode of roofing, which will be found illustrated with engravings in the work quoted. We shall only add, that its appearance is very light and elegant, but that it could not be executed without the aid of the circular saw.

2451. *Suspension Roofs.* The principle employed in suspension bridges is beginning to be applied to roofs both in France and England. In the back premises of Messrs. Gillow, the extensive upholsterers in Oxford Street, part of a roof was suspended by a chain in 1840, under the direction of Messrs. Abraham, architects; and Mr. Hansom of Foley Place, architect, proposes a roof of this kind for the Metropolitan Music Hall, now in contemplation, which, if carried into execution, will be the largest room in the world. The four angles of the building are proposed to be carried up a sufficient height to form the fulcrums for the suspension chains, which may, perhaps, be most advantageously applied in the manner adopted by Mr. Dredge of Bath, in his suspension bridges. (See *Mech. Mag.*, vol. xxxiii. p. 500.)

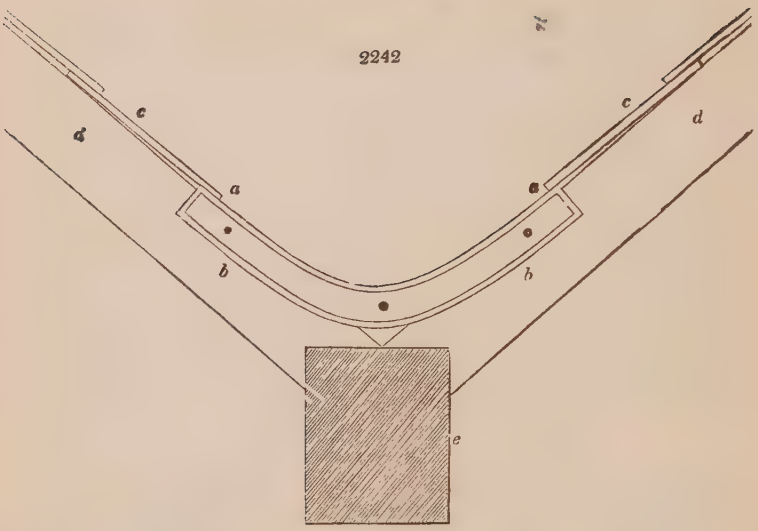
2452. *Sunk Wooden Eaves-Trough for Cottage Roofs*, figs. 2238—2240. This finish to the eaves of a roof has now become very general for country-houses, and deservedly so; being the neatest, cheapest, and most durable of any, and adapted to the humblest cottage as well as to the elegant villa. In order to obtain a fall in the old metal troughs, they are obliged to be fixed a little slanting, which adds to the otherwise unsightly appearance of them; they are also liable to be crushed in by the weight of ladders, &c., placed against them, as well as to a sagging or dropping down between the several iron brackets which support them, and the water from time to time lodging in these parts very soon renders them useless. This is made of the best clean seasoned fir timber, with as few joints as possible, the mitred joints at the angles put together with a comm-



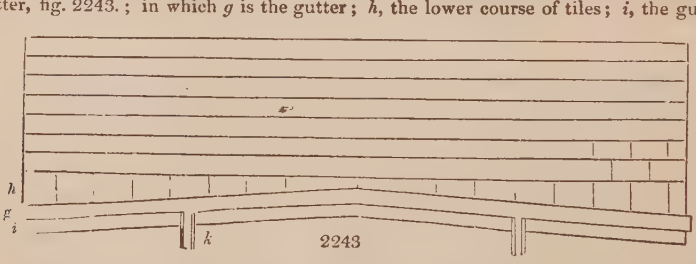


tongue and white lead; about four inches by four inches, more or less, according to the character of the building. It is fixed perfectly level, the fall being within itself, which is obtained by hollowing out the middle, beginning at *x* in fig. 2238., the highest part of the fall, and proceeding gradually deeper to *z*, the lowest; thus, a trough of this description may be fixed along a front of forty or fifty feet in length, the fall being given from the centre to the right and left. It requires no lining, but a thorough good painting, which should be repeated every three or four years. A large moulding being wrought on the front, it is thus made to represent the crowning member of a cornice. Fig. 2239. represents the application of it to a cottage; where *a* is the moulded front of the eaves-trough; *b*, the hollow; *c*, the plastered soffit; *d*, bearer; *e*, rafter; *f*, slating; *g*, front wall of house; *h*, fascia; *o*, wall-plate. Fig. 2240., the same with a higher style of finish. The same letters of reference answer: in addition, *i* shows a lead moulding and fascia in cement, and the plancier, *c*, is curved. It may be finished in a still more elaborate style, with dentils or cantilevers, if required. — *W. Wilds, Architect Hertford.*

2453. *Cast-Iron Gutters to Roofs*, as a substitute for leaden ones, are found economical and effective. Fig. 2242. is a section of a gutter between two roofs, in which *a a* show the gutter, with a flange, *b b*, for joining the different pieces together; *c c*, the slates; *d d*, the rafters; and *e*, the gutter-beam. The fall requisite to carry off the water is found to be from a half to three quarters of an inch in the yard, and this necessarily occasions the plane of the roof to rise towards the centre of the building, as shown in the section, fig. 2241., in which the rise is indicated by the dotted lines *f f f f*.



All the care that this requires in slating or tiling is, to bring the upper edge of the lower course of tiles to a level, as indicated in the longitudinal section through the gutter, fig. 2243.; in which *g* is the gutter; *h*, the lower course of tiles; *i*, the gutter-



beam; and *k*, the hollow posts for supporting the gutter-beam, and serving as pipes for conducting away the water from the gutter. Cast-iron gutters of this sort will be found peculiarly adapted for ridge and furrow hot-house roofs.

2454. *Roofs of native Scotch Fir.* The Closeburn method of preserving the durability of timber consists in first cutting it to the size required, and then steeping it in a pond of limewater for a fortnight, or more or less, according to the dimensions of the pieces. It is found that the acid contained in the wood is crystallised, by combining with the alkali of the lime. Sir Charles Menteath has now some farm buildings on his estate, the timber in the roofs of which is the common young Scotch fir; but, having undergone the limewater process, it is as sound after a lapse of forty years as the day it was put up. The same timber, under ordinary circumstances and in similar situations, would rot in from three to seven years. (*Mech. Mag.*, vol. xxxi. p. 105.) Notwithstanding this statement, the preservative effect of limewater is denied by some, but there can be little doubt that sulphate of copper would be effective.

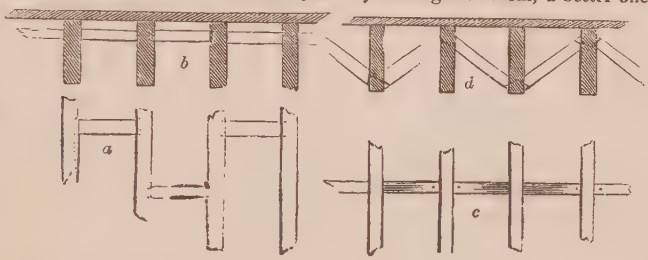
2455. *Thatch may be rendered comparatively incombustible*, by soaking it in whitewash made of lime, or whitening and size, in the usual way, to every four gallons of which has been added one pound, or rather more, of alum. Alum would suffice by itself, but the rain would wash it off. The lime and size form a film over every straw, insoluble in water. (*Mech. Mag.*, vol. xxxvi. p. 106.) If the interior of a thatched roof be kept dry, it will last as long as the timber which supports it. Possibly something might be gained by covering a thin layer of thatch with Pocock's asphalte roofing.

2456. *Martin's Fire-Proof Cement* has been used in various cases by Mr. Cubitt as a substitute for boards in flooring, and it is said Mr. Barry intends to use it in the new Houses of Parliament. Applied to floors, stairs, and partitions, even though only as a

covering to boards, it would go far to render private houses fire-proof. (*Mech. Mag.*, vol. xxxvi. p. 85.) The principal ingredient in this cement is gypsum.

2457. *Cement Floors for Cottage Bed-rooms* have been strongly recommended for their durability, and as, in some degree, rendering cottages fire-proof. They are common in Italy, and to be found in some parts of France and Germany, but they are comparatively rare in England. The best that we know of are at Houghton, in Norfolk, which we examined upwards of thirty years ago, and through the kindness of John Curtis, Esq., who sent us the information respecting building walls with clay lumps (§ 2443.), we are enabled to give the following account of them :—

2458. *The Cement Floors* at Houghton Inn, and in some of the farm-houses on the Houghton estate, are thus formed. The floor joists are laid in the same manner as if for boarding, but well stiffened by what is locally called bridging, which consists of pieces mortised into each joist, as shown in fig. 2244., in which *a* is the plan and *b* the section. But as this mode weakens the joists by cutting into them, a better one would



2244 2245

be, to use cross strutts in the usual manner, as shown in fig. 2245., in which *c* is the plan and *d* the section. Some floors are first laid with reeds, so as to bear the cement on a floor of reeds; and others (which is the better way) are covered with double laths, but the ends of these laths should only just meet in the middle of the joists. The cement is then laid on, half an inch or two inches thick, and the floor must not be left by the workmen till it is quite finished; that is, they must keep beating and smoothing it over, night and day, till it is completely set, in order to prevent its cracking. This can only be done by having a swinging scaffold from the ceiling for the men to work from. The cement must be laid on directly it is made; therefore, while some persons are making it up, others must be laying it on. The cement is commonly called red plaster, which is red gypsum. It is burnt for this purpose, by making a fire with small billets of wood, and mixing small lumps of gypsum with the wood, and then covering the whole with turves to prevent the fire escaping, in the same manner as billets are covered when they are made into charcoal; or a better way is, to grind the gypsum in the flour stones of a mill, and then bake it in an oven, before mixing it into a cement, which should be done with the iron dust which falls from a blacksmith's anvil, and not with the smithy ashes; the scales of iron being so much harder and better for the purpose. Chalk and lime are both unfit for the purpose, though ground floors for cottages and barns are frequently made of these materials, well beaten together.—*J. C.*

2459. *Bed-room Floors, formed of two Courses of plain Tiles laid in Cement,* resting on joists lathed over in the manner described, would, we should think, make very good floors; but, unless they came cheaper than boards, it would scarcely be worth while adopting them. Cottages might be roofed with semicircular arches of tiles, laid in cement, and covered with turf or creeping plants or ivy, so as to render them warm as well as durable.

2460. *Equal Parts of Lime, Sand, and Cinder-dust,* worked up well together, make very good malting-floors; but, as in the process of malting they are occasionally moistened, this composition may not be so well adapted for the bed-room floors of cottages.—*S. T.*

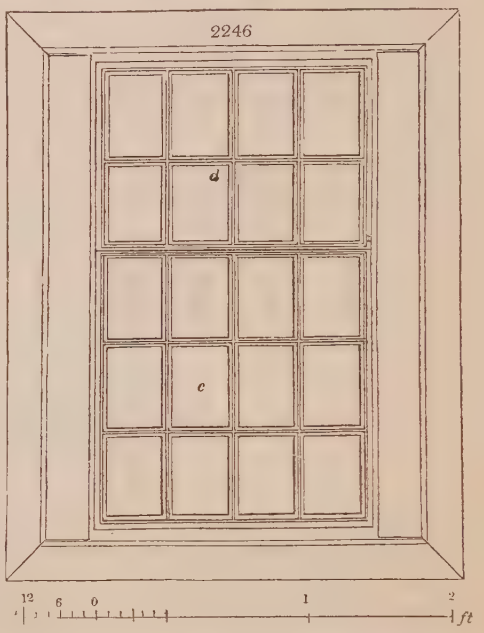
2461. *Clay Floors,* that is, floors formed of a mixture of clay and marl, were formerly a good deal used in Norfolk for barns, malt-houses, hay-lofts, cottages, &c. They are composed of clay and marl mixed with chopped straw, well trodden by horses, and mixed together in the manner clay lumps are to be made (§ 2444.); and, when the mixture is to be used for malt-floors, bullock's blood is added. Much of the excellence of these floors depends on the thoroughly mixing and working of the material.—*W. T.*

Sect. III. *Windows and Doors.*

A great drawback to the improvement of cottages, both in Scotland and England, hitherto has been the expense of the windows; but these are now manufactured of cast iron at so moderate a rate, that the expense can no longer be an object of solicitude.

2462. *Windows* having been generally among the worst constructed parts of Scotch cottages, the Highland Society offered a premium for the best cottage window, which was awarded to Messrs. M'Culloch and Co. of Glasgow, for the form shown in figs. 2246. to 2248. This form, of the dimensions shown in the figure, viz., three feet three inches by two feet, without the wooden frame, costs, in cast iron, only 5*s.*, and the glass for such a window may be purchased at 2¾*d.* per square. This kind of window admits of being formed of any size, and is equally adapted for workshops, farm buildings where glass windows are required, and cottages.

2246

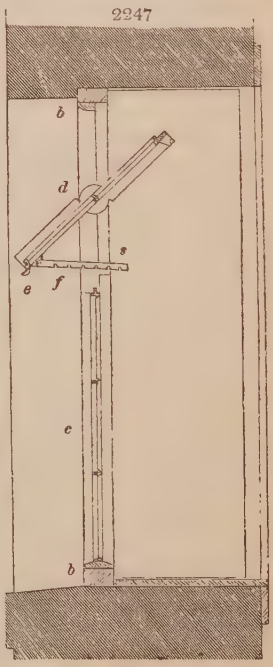


The dimensions that have been recommended for the windows of ordinary cottages are, thirty-nine inches for the height, and twenty-four inches for the width, within the wooden frames. The size of glass required for these frames is seven and a quarter inches by five and a quarter inches. The sash is divided into two unequal parts, the lower part having three squares in height, and the upper part two. The lower part is permanently fixed, while the upper part is constructed to turn in the vertical direction on pivots, which are situate in the line of its middle astragal; and both parts are set in a substantial wooden frame, which may be either built in while the wall is erecting, or may be set in afterwards in the ordinary way, with or without checked rabbets (§ 911.), according to the taste of the proprietor. The window, and its arrangements, will be better understood by reference to the annexed figures.

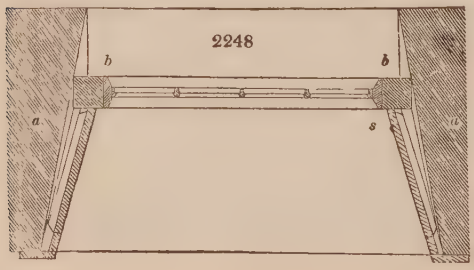
Fig. 2246. is an inside elevation, fig. 2248. a plan, and fig. 2247. a vertical section, in each of which a portion of the wall is exhibited, and the same letters refer to the corresponding parts in each figure; *a* is a portion of the surrounding wall; *b*, the wooden frame of the window; *c*, the lower sash, which is dormant; and *d*, the upper and movable sash.

In fig. 2247. the upper sash is represented as open for ventilation; when shut, the parts of the opening-sash cover and overlap the fixed parts in such a manner as to exclude wind and water; but, when ventilation is required, the arrangement of the parts which

2247



2248

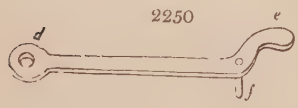


produce this is such as to enable the housekeeper to admit air to any extent. For this purpose the notched latch, *e*, is jointed to a stud in the edge of the sash; a simple iron pin or stud is also fixed in the wooden frame at *s*, and the notches of the latch being made to fall upon this stud at any required distance, the requisite degree of opening is secured, and when the sash is again closed, the latch falls down parallel with, and close to, the sash. To secure the sashes when shut, the T bolt, *f*, in the middle of the meeting bars, has only to be turned one fourth round, and the movable sash is held fast in close contact with the other. The figures represent the window as finished up with single dressings, viz., plain deal shutters, facings, and sole, which, at a small expense, would give an air of neatness and comfort to the apartment, and promote a corresponding taste in the other parts of the cottage. Though the dimensions of the window here stated may be conceived sufficient for lighting an apartment of ordinary size, they can nevertheless be varied to suit every purpose. This may be done either by employing two such windows as above described, with a mullion of wood or stone between them, or the single window may be enlarged by one or two squares in width, or in height, or in both directions." (*Highland Soc. Trans.*, vol. xiii. p. 541.)

2463. *The Belper Cottage Window* is formed entirely of cast iron, and has a compartment in the centre which opens. It differs from the Glasgow window in the nature of the fastening which keeps the window open or shut. To give an idea of the value of this fastening, it is necessary to observe that, in the latticed windows of cottages, there is very frequently either one entire frame, or a portion in the centre of one, which opens, and is kept open by an iron stay-bar, with an eye at one end which moves on a staple attached to the fixed part of the sash, and a hook at the other which drops into an eye in the part of the sash which is to be opened. Now, the objection to this hooked fastener is, that, as there is only one eye for the hook to drop into, the window can only be opened to the same width, whether the ventilation required be little or much; and when the stay-bar is not in use, it hangs down and is blown about, and very frequently breaks the glass. The new stay-bar, on the other hand, opens the window or door to which it may be applied to various widths at pleasure, from an inch to the whole width of the window or door, and the stay-bar can never hang down, or run the slightest risk of breaking glass.

The general appearance of the new stay-bar, supposing the window to be open to its full extent, is shown in fig. 2249.; in which *a* is the stay-bar, which turns on the pivot *b* at one end, and slides along a horizontal groove under the guide-bar, *c*, at the other.

Fig. 2250. is a view of the stay-bar apart from the window, showing the eye, *d*; the handle, *e*; and the stud, *f*, which drops into holes in the horizontal groove, so as to keep the window open at any desired angle.



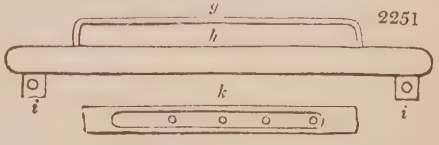
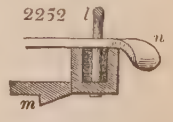
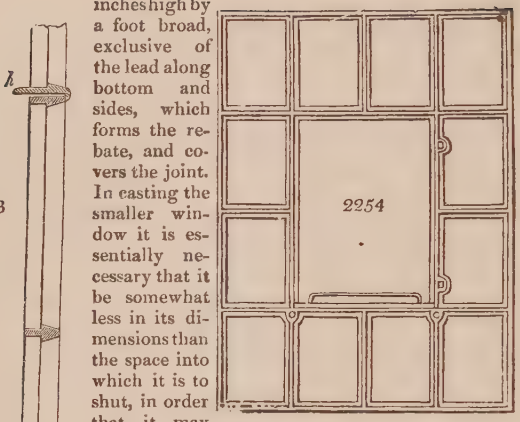


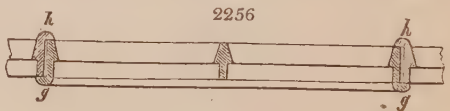
Fig. 2251. is a view of the groove and the guide-bar; *g* is the guide-bar, or small rod, which is for the purpose of keeping the stay-bar in its place in the groove *h*; *i i* are two plates with holes, by which the groove and guide-bar are riveted to the window; *k*, vertical profile of the groove, the guide-bar being removed, so as to show the holes into which the stud of the stay-bar drops. The groove is of cast iron, and the guiding-rod is of wrought iron, let into it and riveted, and both are bolted to the bar of the window by means of the plates *i i*, which are of cast iron. Fig. 2252. is a section across the groove, the guiding-rod, *l*, and the bar of the window, *m*, to which the groove is bolted; *n* is the handle of the guide-bar.



The window is cast in two pieces; the larger, fig. 2254., being two feet ten inches high by two feet one inch broad; and the smaller, fig. 2255., being one foot four



inches high by a foot broad, exclusive of the lead along bottom and sides, which forms the rebate, and covers the joint. In casting the smaller window it is essentially necessary that it be somewhat less in its dimensions than the space into which it is to shut, in order that it may always move freely. The air is kept out from the room within, not only by the tight fitting of the sides of the small window to the sides of the frame, but by the contact of the edges of the sides of the small window with the heads forming the rebates attached to the inside of the frame; and also by means of the contact of the beads, or rebates, of the small window with the edge of the sides of the large one, or frame, into which it shuts.



In consequence of the sides never touching, the window moves with the greatest ease, whether expanded by heat in summer, or contracted by cold in winter, and whether painted and smooth, or unpainted and rusty. Fig. 2256. is a horizontal section across the small window and the two side bars, showing the outside beads at *g g*, and the inside beads at *h h*. Fig. 2253. is a vertical section through the small window and the top and bottom bars of the fixed frame, showing a weather-fillet, or weather-table, which projects half an inch from the general face of the window at *h*, and the stay-bar in the situation in which it rests when the window is shut, and also the groove and guiding-rod at *i*. The total weight of this window, before being glazed, is about 61¼lb., and the prime cost in Derby is 12*s*. 4½*d*., thus:—

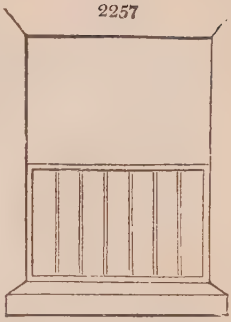
	s.	*d.*
Two castings, 60lb., at 1½*d*. - -	7	6
Iron-work, 1¼lb. at 1*s*. 1*d*. - -	1	4½
Fitting-up, 6 hours, at 24*s*. per week -	2	0
Scurfing castings, 4 hours, at 12*s*. per week	1	0
Priming window, 3*d*., and paint, 3*d*. -	0	6
Prime cost -	12	4½

We can bear testimony to the excellence of this window, having seen it extensively in use at Millford and Belper, near Derby, where it was invented by Anthony Strutt, Esq.

2464. *A Cast-Iron Window and Wooden Shutter, adapted to Warehouses, Granaries, and other Farm Buildings.* The accompanying sketches, figs. 2257. to 2259., are of a cast-iron window and shutter, which, from the simplicity and security of the construction, appear to be worthy of imitation. Fig. 2258. is a section of the window, in which *a a* represent the shutter open; it being hung upon centres fixed to its two sides, and working in the outside frame. The outside, or top, of the shutter is the longer, and, consequently, the heavier, end; or the shutter may be kept open by a bolt or wedge under it, as at *b*. The sashes *c* and *d* are so far apart as to leave room for the shutter at *e* and *f*, when it is closed; and at *g* there is a fastening to secure the bottom of the shutter. Fig. 2259. is an elevation of the window, with the shutter in the position in which it is shown in the section fig. 2258.; and fig. 2257. is an elevation of the window when the shutter is closed; both of which are sufficiently explanatory to render description unnecessary. It will be seen that, by this mode of constructing warehouse or granary

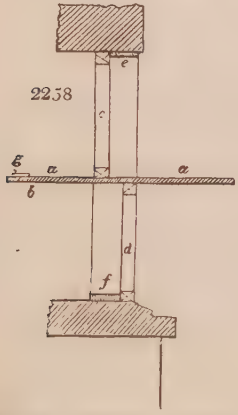
windows, there is, when the shutter is open, excellent ventilation and light, as well as perfect security. Brumet and Cope's Venetian blinds of wrought iron have been very generally employed in London, as protective shutters to the windows of dwelling-rooms and to shops. The Duke of Wellington first brought them conspicuously into notice by employing them to protect his first-floor windows in Piccadilly. When not in use they are rolled up, and sheltered from the weather by a hood; and, when let down, they have rather an elegant appearance than otherwise, from their resemblance to Venetian blinds. They are commonly painted green; but this colour seldom harmonises with exterior architecture.

2257



2465. *The upper Sashes of Windows should not be fixed,* because, when this is the case, the room to which they give light can never be properly ventilated (2475.). As an additional argument against having the upper sashes of windows fixed, a practice common in the north of England and Scotland, the windows, whenever they are above

2258



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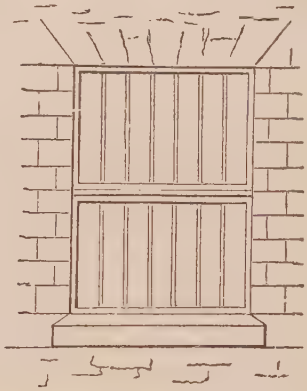
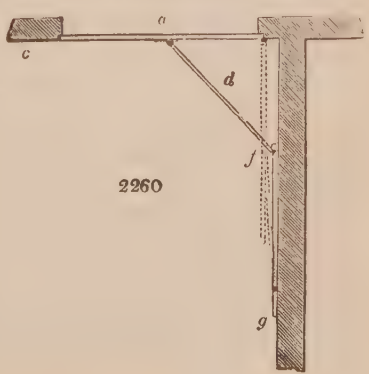


six feet high, cannot be cleaned, painted, nor a new pane put in, without the use of a very long ladder. (*A. M.*, i. 247.) An apparatus for cleaning the outsides of lofty windows of this kind is described and figured in *Arch. Mag.*, vol. i. p. 392.

2466. *Windows brought down to the Floor,* by reflecting light up to the eye, are much less agreeable than those that do not come lower than the height of a chair back, and they also give the worst light for displaying pictures. Nevertheless, windows down to the floor are more cheerful where there is any thing near at hand worthy of being looked out on.

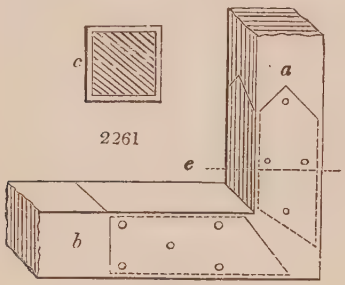
2467. *A Door Stay-bar.* The Belper window stay-bar, it will readily be conceived, may be applied to the opening of doors to any angle, or keeping them closely shut All that is necessary is to place the groove, in which the bar works, against a wall or other fixture, so that it shall stand horizontally at right angles to the door or gate. Fig. 2260. represents a horizontal section through a door, *a*; the wall of the hanging style to which it is hinged, *b*; and the wall against which it shuts, *c*. The gate or door is supposed to be shut, and it is held in its place by the stay-bar, *d*, which moves on a stud at *a*, and at the end along a groove from *f* to *g*. If we suppose the end of the stay-bar at *f* secured in its place by a padlock, it will be next to impossible for housebreakers to open the door, *a*; because they could not by any means reach as far as *f*, to pick the padlock. Other details of this door stay-bar, and its application to various

2260



kinds of doors and gates, will be found by referring to the *Gardener's Magazine* for 1839, p. 440.

2468. *Cast-Iron Angles for outside Doors* would render them more durable. In fig. 2261., *a* is the upright style; *b*, the bottom rail; *c*, the horizontal section at *e*, *f* showing the top of the iron angle foot, and the section of the style. There would be much saving of labour and great durability in making door-frames in this manner.



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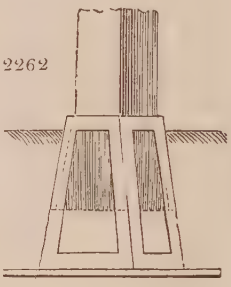

2262

2263

2469. *Cast-Iron Sockets to Wooden Posts*, fig. 2262., may be made very light, and being fitted to the part of the post to be inserted in the ground would render them much more durable, as well as much more architectural, since the posts would rise out of a proper base.

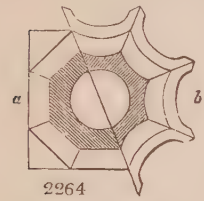
2470. *Doors to Rooms should be hung on the Side nearest the Fire.* First, then, I have observed that when doors are not hinged on the side nearest the fireplace, the smoke is drawn out every time they are used; secondly, I think I can account for this circumstance in a very simple way: the air that is displaced by the motion of the door is supplied by that which is near the fire; and, consequently, a vacuum is created, or the current of air that is feeding the fire is interrupted, and part of the air that had entered the chimney returns with the smoke to supply its place, or, in common parlance, it "puffs out." In the case of the door being hinged on the opposite side, the vacuum is supplied either by the expansion of the whole of the air in the room, or by some current, without disturbing the current of air that flows to the fire.— *T. W.*

2471. *To prevent the slamming of a Passage Door.* Fig. 2263. represents one side of the door-case. Instead of fixing the piece of wood which joiners call the check-plate on this, a similar piece is taken and prepared by being cut hollow on the edge *a*, which the door strikes on, and then cut down by saw-draughts (slits made by the saw), as represented by the lines *b b* in the figure, leaving a portion in the middle equal to one fourth or one fifth of the length uncut; it is then securely fixed by screws to the door-post, as shown in the sketch at *c* The door, of course, first strikes against the top and bottom extremities of this check, and must press them back before it can reach the solid part of the plate in the middle. If, therefore, the plate of wood be made of such breadth and thickness as that the united resistance of its ten or twelve springs be a little greater than the force the door strikes with, it will never reach the solid part at all, and its slamming will be nearly inaudible, however strong the current of air may be. This has been proved to succeed perfectly, after all sorts of iron springs and checks have failed to remove the nuisance.—*J. R.*

Sect. IV. *Chimney-Tops and Smoky Chimneys.*

2472. *Every Chimney or Stack of Chimneys*, to be truly architectural, ought to be treated as a column, or as a group or series of columns; and as every column consists of three parts, a base, a shaft, and a capital, so ought every chimney-top. As an example of this we shall take fig. 2265., which is a column from a stack in Eastbury House, in Essex. It is entirely built with brick, and rises seventeen feet above the cornice of the base on which it is placed. In fig. 2264., *a* is the plan or horizontal section of one half of the shaft at *a* in fig. 2265.; and *b* in fig. 2264. is the plan of the upper member of the capital at *b* in fig. 2265. There is a stack of five of these shafts in the centre of Eastbury House; and by their beautiful proportions, and commanding height above the roof, they produce a strikingly grand and picturesque effect. There are many examples of brick chimney-shafts still remaining in the ancient mansions of England well deserving the attention of the architect; and as chimney-

shafts form a principal feature in modern domestic architecture, their forms and situations cannot be too much studied.—*E. B.* Every person that has a house designed for him ought to object to every chimney-top, whether Grecian or Gothic, that does not consist of an obvious base, shaft, and capital, and the base ought in general to be somewhat higher than the ridge of the roof. In general, all the upper terminations of a building ought to be bold and free; and this cannot be the case with chimney-shafts, unless they have a distinct base, a shaft of considerable length, and a capital consisting of several members according to the style of architecture employed.



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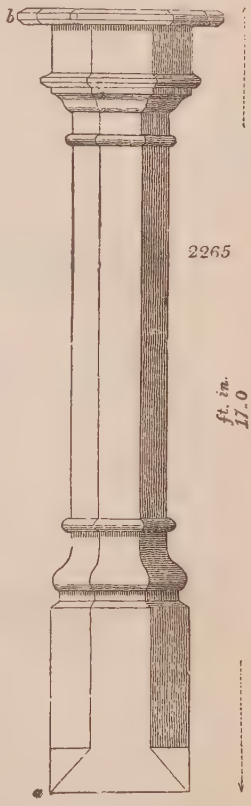

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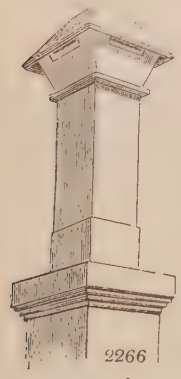
2473. *In Chimneys of Cottages built in Woods*, and where overhanging branches of trees may prevent the egress of smoke, care should be taken to contract the smoke-flue or vent, in an ordinary-sized room, to seven inches square, at about eighteen inches above the grate, gradually widening it to ten or eleven inches square. The heat forces the smoke through the narrow aperture, and it increases in volume the farther it rises from the heat, as may be easily observed, as it ascends in curls, gradually increasing above the chimney-top. By attending to this simple rule, which was with some difficulty imposed on the masons who built Annat Cottage (§ 2360.), which is surrounded with lofty trees, the rooms are free from smoke.—*A. G.*

2474. *A Chimney-pot for preventing Smoke from being blown down a Chimney* has been in use at Poole Park, near Ruthin, Denbighshire, for several years; and we are informed, by Lord Bagot's agent there, that it has answered, and continues to answer, in every instance in which it has been applied. It is formed of cast iron; and the appearance of it as seen from below is shown in fig. 2266. It is cast in eight pieces, which are put together as shown in fig. 2267. *a*; by which it appears that the upper part of the pot is one foot four inches in height; and the neck, which is inserted into the flue, is eleven inches on the side. The length of the neck may be increased at pleasure, so as to produce the appearance shown in fig. 2266. A vertical section of this chimney-pot is shown at fig. 2267. *b*: *c* and *d* are elevations of the two pieces, four of each of which, when screwed together, form the pot. We have sent a model of this pot, which was kindly forwarded to us by Mr. Turnor, Lord Bagot's agent at Poole Park, to Messrs. Cottam and Hallen, iron-founders and manufacturers Winsley Street, Oxford Street, London; from whom pots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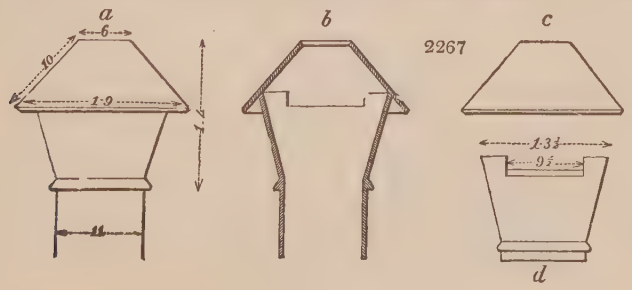

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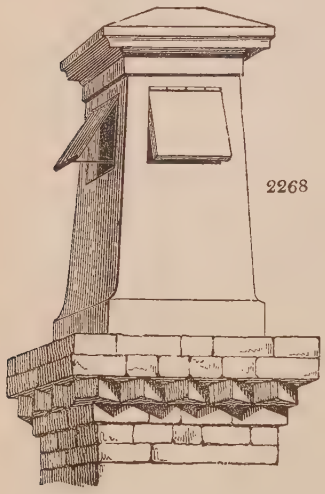
of this kind may in future be purchased. Fig. 2268. shows the form of a cast-iron chimney-pot, in use in the neighbourhood of Barnsley, in Yorkshire; where it has been tried for a number of years, and is considered to be an effective cure for a smoky chimney, where the smoke is blown downwards by wind. Fig. 2269. shows the general appearance of a chimney-top furnished with pots of this kind. The usual form of this pot is that of a truncated pyramid, as in fig. 2268.; but it might easily be made to terminate in a Gothic pinnacle, or in any other ornament which was considered suitable to the style of the building to which it was to be applied. It might even be made circular, and used in the case of cylindrical chimney-shafts, built in the form of Grecian columns. Where the form is that of fig. 2268., the four sides are cast separately, and bolted together; and, where the pot is to stand alone, or with a short distance between it and other pots of the same kind, each side is fitted up with a hinged door, as shown in figs. 2268. and 2269.; but, where the pots are to stand close together, these hinged doors are only placed on the two exposed sides. The top, in either case, is closed with an iron cap. Each hinged door is connected with the opposite one by a rod of iron, about two inches longer than the diameter of the pot; so that, when the



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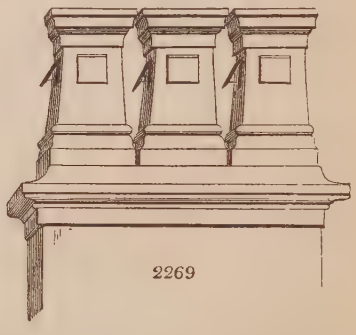

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weather is calm, the lower part of each of the four doors projects from the chimney-pot about one inch; while, on the other hand, when the wind blows, it closes the door on the side against which it strikes, and opens the door on the opposite side to the extent of two inches. It is evident that the same kind of doors might be introduced near the termination of each flue, in an architectural chimney-top without pots. Other modes of curing smoky chimneys by pots, either ornamental in themselves, or rendered so by architectural casings, will be found in the *Suburban Architect, &c.*, chap. i.

Sect. V. *Ventilation.*

2475. *Ventilation.* The following extract is from a work which ought to be in the hands of every individual, but especially in those of every architect, viz., Combe's *Principles of Physiology applied to the Preservation of Health*, third edition. "One of the evils of ignorance is, that we often sin and suffer the punishment, without being aware that we are sinning, and that it is in our power to escape the suffering by avoiding the sin. For many generations mankind have experienced the evil results of deficient ventilation, especially in towns, and suffered the penalty of delicate health, headachs, fevers, consumptions, cutaneous and nervous diseases; and yet, from ignorance of the true nature and importance of the function of respiration and of the great consumption of air in its performance, architects have gone on planning and constructing edifices and houses, without bestowing a thought on the means of supplying them with fresh air, although animal life cannot be carried on without it; and, while ingenuity and science have been taxed to the uttermost to secure a proper supply of water, the pure air, though its admission is far more essential, has been left to steal in, like a thief in the night, through any hole it can find open. In constructing hospitals, indeed, ventilation has been thought of, because a notion is prevalent that the sick require fresh air, and cannot recover without it; but it seems not to have been perceived, that what is indispensable for the recovery of the sick may be not less advantageous for preserving from sickness those who are well. Were a general knowledge of the structure of man to constitute a regular part of a liberal education, such

inconsistencies as this would soon disappear, and the scientific architect would speedily devise the best means for supplying our houses with pure air, as he has already supplied them with pure water." (p. 236.)

Few modern practices in building are more absurd than that of making the doors and windows of rooms air-tight, and yet expecting that there can be a sufficient draught in the chimneys to prevent them from smoking. There ought to be a contrivance in the upper part of every door and window for admitting air, merely for the sake of supplying the chimney. (See Sir John Robison's House, § 2378.) In the case of doors, instead of having them to fit exactly at the top, we would leave from a fourth to half an inch, according to the size of the room; and, in the case of windows, we would leave that space in all those that fronted the points from which the wind was mildest, and half as much in the case of windows facing the north. The advantage of admitting the fresh air at the upper part of the room is, that it comes immediately in contact with the hottest air of the room, and is thus rendered temperate before it reaches persons seated in the middle of the room, or near the fireplace; whereas, when the air is admitted or drawn in by the bottom or lower parts of doors or windows, it slides along the floor towards the fireplace to supply the draught, at once cooling the feet of every one in the room, and leaving the great body of the air of the apartment entirely unchanged. It thus frequently happens that a person is seated in a room in which there is a brisk fire, with his feet and legs in an atmosphere of forty degrees of air continually changing, and consequently carrying off heat from him, and his head in an atmosphere of a temperature of sixty degrees, which, unless the door of the room is frequently opened and shut, or the breast of the chimney is higher than usual, is never changed at all, and, consequently, is breathed and rebreathed by the occupants. We have often been perfectly astonished at the ignorance of professional men on the subject of ventilation, and equally so sometimes at their speculative impracticable notions; such as ventilating by small tubes, &c. The only practicable mode of judiciously ventilating apartments in modern houses, without radical changes in construction, we venture to state is that above suggested: but even that simple mode will not be adopted till the occupiers of houses are aware of the importance of ventilation. One piece of advice we would wish to impress upon every reader, viz. never to take a lodging, or rent a house, in which the windows are not carried up as high as the cornice of the room. Unless this be the case, the ventilation, even by the mode we have suggested, must necessarily be imperfect; because the stratum of air between the top of the window and the ceiling will remain unchanged, and of no sort of use to the occupants of the room. Many hundreds of houses about London, which have a splendid appearance exteriorly, have this defect within. It will be found in the bed-room floors of most of the houses round the Regent's Park, and, indeed, more or less, in almost all the new houses everywhere, that have any pretensions to exterior architecture, and especially to a frieze and cornice. As these houses are generally built on speculation, by persons whose great object is to get them sold as soon as possible, this utter neglect of the health of the occupant is not to be wondered at, more especially as the occupant is generally too ignorant to detect the evil; but what excuse shall we find for architects who commit the same fault in the country-houses of wealthy noblemen? We could refer to many new country-houses where this is the case: we have in our mind's eye the state bed-room of a noble marquess lately married, in which the space above the windows is upwards of ten feet, and, the whole height of the room being twenty feet, it follows that exactly one half of the atmosphere of the room is rendered useless. The misery and suffering in cases of this kind, however, are nothing to that which must be endured by those who have no other room to live in but one, and that one perhaps not above seven or eight feet high. It is lamentable to think that this misery must be endured by the passing generation, and even by that which is rising to succeed it, till, as Dr. Combe observes, a general knowledge of the structure of man enters into a system of general education. There is no better substitute for this defect in our education, that we know of, than Dr. Combe's most excellent work.

2476. *Ventilation in Public Buildings* is most effectually obtained by having a fire in the upper part of the building, which can only be supplied by air drawn from the different rooms below by means of air-flues. In private buildings, instead of a fire, these flues may communicate with, or be carried up alongside of, the smoke flue of a fire kept constantly burning, such as that of the kitchen.

2477. *Ventilation of Bed-rooms.* There should be a constant circulation of fresh air in bed-rooms. The lungs must respire during sleep as well as at any other time, and it is of great importance to have, when asleep, as pure an air as possible. It is calculated that each person neutralises the vivifying principle of a gallon of air in one minute: what havoc, therefore, must an individual make upon the pure air of his bed-chamber, who sleeps in a bed closed snugly with curtains, with the doors and windows shut, and

perchance a chimney-board into the bargain. Our health and comfort depend more upon these apparently trivial points than most people are aware of. (*A. M.*, i. 87.)

2478. *Warming and Ventilating.* The objects to be aimed at are, pure and cool air to breathe, and radiant heat to warm the person. The evils to be avoided are, currents and draughts, whether hot or cold, and over-heated air for respiration. The larger and loftier the room, the more effectually can fresh air be introduced, without any rapidity of current. The impure exhalations rise to the ceiling, and their place is supplied by fresh air from below. In short, the upper part of a room may be considered as a reservoir of the impurities which are generated in the lower part by the persons breathing there. In ordinary houses, the simplest and best mode of warming and ventilating is to have some description of hot-air stove placed at the bottom of the staircase, which shall heat a current of air introduced from without, or, in small houses, drawn from the air within the lower part of the house. The heated air so generated will ascend the staircase, and, consequently, enter all the rooms which open into it. There are many different kinds of stoves that may be used for heating the air; one of the best is the invention of White of Haddington, of which there are various sizes, at different prices, from £3 10*s.* to £30 or £40. The smallest size will suffice for a house of ten or twelve rooms. (See next chapter.)

2479. *Cooling and Ventilating in warm Climates.* Captain R. Wainhope, R. N., has shown, in *Jameson's Journal*, Oct. 1831, that this may be easily effected by forcing in air through porous earthenware tubes, kept moist exteriorly. The great evaporation which will take place on the outer surface of the pipes will cool the air in its passage through them. If, by some similar process, the air charged with moisture in cold climates could be deprived of that moisture before it entered dwelling-houses, the benefit to invalids would probably be very great.

Sect. VI. *Tanks and Cottage Privies.*

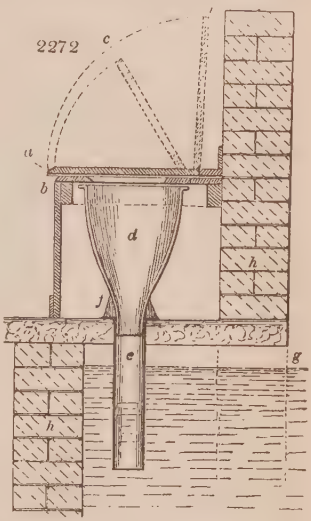
2480. *A Tank for Rain-water.* The ground having been taken out to the required depth, pave the bottom with one flat course of bricks grouted with cement, and on this set singly two courses of plain tiles in the same material Form the sides each of two four-inch walls of bricks and cement, breaking the horizontal joints: and, when completed, render the whole of the interior with cement one inch in thickness. Turn a brick arch in mortar over the tank thus formed, leaving a man-hole, two feet square, with proper trimming stones, and a Yorkshire stone-paving cover; or cover entirely with flag-stones. The suction-pipe of a pump placed within a few inches of the bottom, and a small drain introduced at the top of the tank, and communicating with a sewer or cesspool, to carry off the superfluous water, when there is any, are then all that are required to render the tank fit for use.

2481. *Filtering the Water from the Roof of a Cottage into a Tank or Well.* The well, of which *a* in fig. 2270. is a ground plan, is supposed to be formed adjoining the sink in the scullery, or partly within the scullery and partly without, as indicated in the model plan in p. 1188.; and the filter, *b*, is supposed to be formed adjoining the wall, but outside the house: *c* is the situation of the pump, which ought to be such as to deliver the water into vessels held over the sink-stone. Fig. 2271. is a section of the

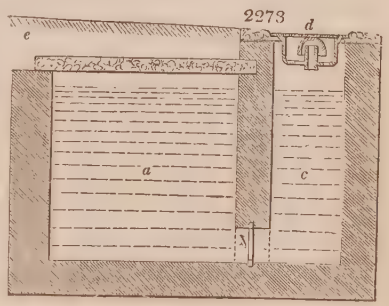
well and of the filtering apparatus; the latter being placed close to the wall outside the scullery: *d* is the slate cover to the filter; *c*, the tube which conveys the water direct down from the gutters to a plate of slate or zinc, *e*, pierced with small holes; *f*, sand and charcoal, supported on a lower plate, also marked *e*; the opening by which the water passes into the well is shown at *g*; and the cover to the well, consisting of a Caithness flag-stone, at a short distance beneath the surface, is shown at *h*. The two

plates of slate or zinc, *e e*, rest on pieces of slate which project from the sides of the filter-box, as indicated by the dotted lines at *b* in fig. 2270. The sand and charcoal can be taken out and cleaned at pleasure.

2482. *Constructing a Cottage Privy in Connexion with a Cesspool or Tank for Liquid Manure.* The privy may be either partially or wholly over the tank, which ought to be closely covered, on a level with the privy floor, by a flag-stone, as shown in fig. 2272. In this figure, *a* represents the seat, which is hinged, in order that when the slops of the house are being thrown in from a pail, or other large vessel, the seat, or pierced flap, may be lifted up, to keep it from being wetted (see page 1131. No. 11.); *b* shows the fixed and permanent seat, on which the moveable seat, *a*, rests; *c* shows the movable seat partially raised up; *i*, the flap or cover to the whole raised up; *d*, the basin of stone ware, cemented at *f* into a tube, *e*, also of stone ware, or it may be of wood or metal; *g* is the surface of the water in the tank, higher than which it can never rise, in consequence of a waste drain; and it will only fall lower than the bottom of the tube *e* when the tank is nearly empty; *h h*, the walls of the tank, and of the back of the privy.



2483. *The Liquid-Manure Tank.* Fig. 2273. is a section of the liquid-manure tank, supposed to form also the tank for the privy. In this figure, *a* represents the liquid; *b*, a pierced slate or grating, through which the liquid filters into the well, *c*; *d*, a bell-trap to admit the drainings of the yard, and to prevent the rising of smells; and *e*, the covering of flag-stone and earth. On a level with the surface of the water in the well, *c*, there is an opening to a small waste drain, which, as it can only be entered by filtered liquid, cannot readily be choked up. Wherever a proper value is set on liquid manure, however, the cesspool will never be allowed to overflow. The most convenient mode of taking out the water from the well, *c*, is by a pump; but where this is wanting, the cover, *d*, may be taken off, and a vessel dipped into it. It is unnecessary, after what has been stated in § 2408., to add, that the sides and bottom of the tank and well should be built in Roman cement; or that occasionally, perhaps every year or every two years, the tank will require to be cleaned out. Some recommend mixing powdered gypsum with the liquid, in order to neutralise the ammonia

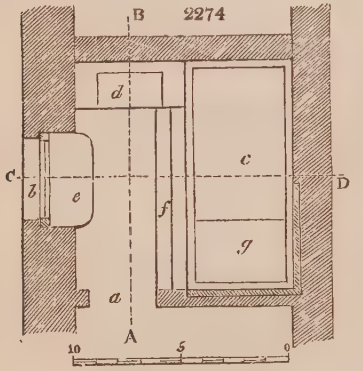


Sect. VII. *Construction and Arrangement of a Bath-Room.*

2484. *The Bath-Room, comprising a common and Shower Bath.* Invalids sometimes require to know exactly the quantity of water which forms the shower, as well as its temperature, and for this purpose there is a supply of both hot and cold water to the shower cistern. A gauge to indicate the quantity of water in the cistern and its temperature, and also the means of regulating them, is contrived in the following manner: The gauge consists of a tube as high as the cistern is deep, fixed on the outside of the cistern, and communicating with the bottom of the inside; in consequence of which, when water is let into the cistern, it rises to the same height in the tube. In order that the water may be seen, the front of this tube, which may be about three inches in width, and a foot in height, is formed of a narrow pane of glass, and one side of the case into which the glass is fixed is divided into equal parts, like the scale of a thermometer, each part or degree representing a pint of water. This tube is open at top, for the purpose of cleaning the glass, should it get dim, but chiefly for the purpose of putting in and taking out a thermometer with coloured spirits of wine, which shows through the pane in front the temperature of the water admitted into the cistern and rising into the gauge. There is a pipe of cold, and another of hot, water communicating with this cistern: and

each is closed or opened by a trigger-stopper, operated on by a cord; and hence the temperature may be regulated by the thermometer at the pleasure of the bather.

Fig. 2274. is a plan of the bath-room, in which *a* is the door; *b*, a window; *c*, the bath; *d*, a chaise-percée, with a fixed waste-pipe; *e*, a wash-hand stand, with a fixed basin, supplied with hot and cold water in the usual manner, with a waste-pipe for letting off the water; *f*, two steps to ascend to the bath; and *g*, a movable seat in the bath, formed of bars two inches broad, with intervals of two inches. The lateral dimensions of the room are about ten feet by twelve feet, and it is twelve feet high.



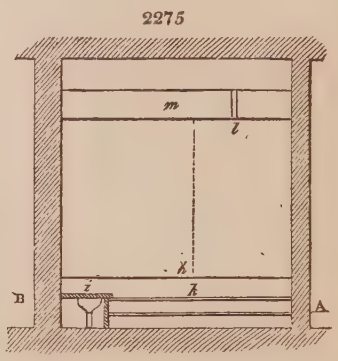
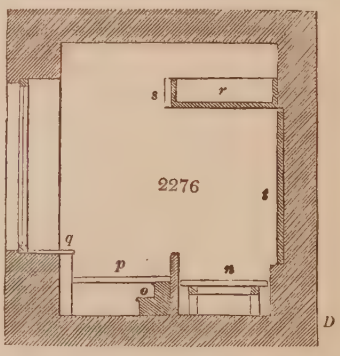


Fig. 2275. is a section on the line A B, in which *h* is the upper edge of the bath; *i*, the chaise-percée; *k*, the steps; *l*, the glass front of the gauge of the shower-bath; and *m*, the cistern of the shower-bath.

Fig. 2276. is a section on the line C D, in which are shown the bath with the stool, *n*; the steps, *o*; the chaise-percée, *p*; the wash-hand stand, *q*; the shower-bath cistern, *r*; and the glass gauge, in which is also kept the thermometer, *s*.

2485. When a shower-bath is to be taken, the bather first pulls a string to admit the cold water into the cistern; or, if it is to be slightly warmed, he pulls a second string, observing the gauge as to quantity, and the thermometer within it as to temperature. He then takes a small tray of sheet lead, about eighteen inches square, with the sides raised about two inches; he sets this on the top of the seat, having previously moved it to the end of the bath from which the shower is to fall. He next draws some water from the cock in the wash-hand stand in a jug, and pours it into the tray, to prevent his feet from feeling the chill of the lead. He now ascends the bath, stands on the leaden tray, having previously opened two doors, which, when closed, appear as part of the sides of the upper part of the bath, as indicated by the double lines at *t* in fig. 2276. These two doors, when fully opened, completely enclose the bather, who has only to pull a third string, which furnishes the shower. The doors may be kept in their new position by a fastening, which may be moved either from within or from without (the latter in case of accident to the bather); but this is only found necessary when the risk of the bather falling is apprehended from the violence of the shock. There are a great many different kinds of baths, portable and fixed, recommended by tradesmen, and, in consequence of ill health at various periods during the last forty years, we have had occasion to try several of them. We are compelled to acknowledge that most of the portable baths heated by small stoves with movable smoke pipes, the ends of which are inserted in the chimney of the bed-room to which the bath is brought, have, in our case at least, proved unsatisfactory, from the length of time required to heat the water. A good plan for small houses and ordinary establishments is, to have a bath-room on a level with the kitchen or scullery floor, and to have, when a bath is wanted, the water heated in the copper in the kitchen or scullery, and conveyed to the bath by pipes re-



gulated by cocks. We are aware of a great variety of modes by which the water may be heated and conveyed to different parts of a house; but, except where such kitchen apparatus as that employed by Messrs. Steel and Co. is in use, or where there is a boiler in the attics (see § 1858.), they cannot, as we have experienced, be depended on.

This bath-room (described from one in a house in the neighbourhood of London) is on the bed-room floor, and supplied with hot water from a boiler in the floor above, which also supplies the nursery and all the other bed-rooms and dressing-rooms. The cold water is supplied from a cistern in the upper part of the house, which is completely excluded from the frost by a double roof. The cold and the hot water are incorporated by stirring with the pierced spatula, fig. 2277., in the usual manner; the round holes in the spatula having been made by a gimlet of large dimensions. There is ready access to the cistern by a door, by opening which heated air can be admitted at pleasure during severe frosts. From this cistern pipes are conducted in situations where they are secure from frost, and where they can be readily examined and repaired, to all the water-closets, and fixed wash-hand basins, &c. There are two water-closets on each floor, near the two extremities of the central passage, and there is a housemaid's closet on each floor, with a sink supplied with hot and cold water, immediately adjoining the servants' stairs. The roof of the main body of the house is of brick arches covered with lead; and that of the kitchen and other offices is formed of flat tiles and cement, in Mr. Fowler's manner. (§ 2446.) All the waste-pipes lead to a large cesspool in the yard, which has a man-hole for cleaning it out; and adjoining it is a well, into which the water overflows, and whence it can be pumped up at pleasure, to be used as liquid manure.

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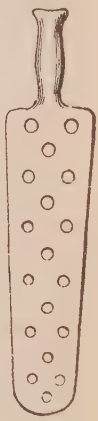

Sect. VIII. *Gates and Fences.*

2486. *A Lodge-Gate Fastening.* Lodge-gates, when in one piece, or single, as the technical term is, are commonly hung at the side farthest from the lodge, with a view, it may be supposed, of bringing the latch as near the person who comes out from the lodge to open the gate as possible. But it must be recollected, that, after the latch is lifted, the operator (who is frequently an old person) must walk across the road, perhaps in the night when it is dark, or during rain or snow, and he or she (for this operation is generally performed by the female occupant of the lodge) must wait on the opposite side, "gate in hand," till the carriage has passed through. Sometimes, also, when the horses are impatient in the day-time, or when it is dark at night, the gate-opener, while crossing the road before the horses' heads, is liable to be knocked down by them, or by the pole of the carriage. These and other inconveniences attending this mode of opening gates are avoided by hanging the gate on the side next the lodge, and by having a long horizontal rod, reaching from the latch to about the middle of the gate. The gate-opener advances only half across the road, pulls the rod to raise the latch, and walks a few steps backwards, opening the gate to its full width, and is at the same time protected by it. The application of the rod by which the gate is to be opened depends on the kind of fastening used. One of the simplest is, when the latch is retained in its place by a spring, and the rod being used to pull it back so as to open the gate; when the gate is again shut the latch returns to its place of itself. The rod may either be conducted along the top or the side of the upper bar of the gate, or under or along one side of a bar from three to four feet from the ground.

Fig. 2278. shows the mode adopted at Bridge Hill and Allestree, in which *a* is the latch, supported on a fulcrum at *b*, operated on by the S lever *c*, by means of the rod *d*,

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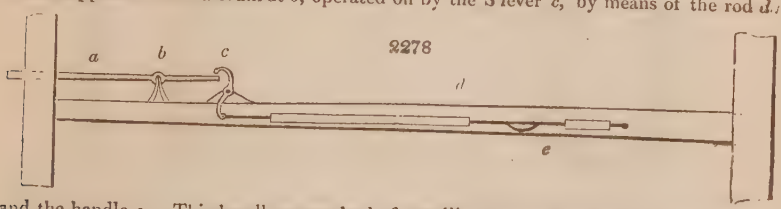

and the handle *e*. This handle serves both for pulling the rod backwards towards the hinges, so as to raise the latch, and for pulling the gate towards the operator, so as to open it by his walking a few steps backwards. For this benevolent invention the public is indebted to the late George Strutt, Esq., of Bridge Hill, Belper, near Derby.

2487. *Cast-Iron Heads or Hanging-Styles to Gates, and Wrought-Iron Rods as diagonal Braces*, are common in field and other gates in the neighbourhood of Derby. The cast-

ron hanging-styles have mortise holes for the ends of the wooden bars, and these are made fast in a very simple but effective mode, which consists in having the mortise wider at one end than the other, as indicated in fig. 2279., in which *a* is a section of the mortise; *b*, the end of the bar which is fitted into it; and *c*, a wedge, which, by keeping the tenon of the bar in its place, effectually prevents it from being drawn out. The hinges of such a gate are much less costly than the common ones, and the gate bars are preserved in their full strength at the tenons. Two wrought-iron rods pass from the bottom of the falling-style through the top of the hanging-style, where they are made fast by nuts on their screwed ends, by which nuts they can be drawn up as tight as may be desired. The wrought-iron rods at the lower end are passed through a thin wrought-iron plate, which forms a sort of shoe to the falling style.

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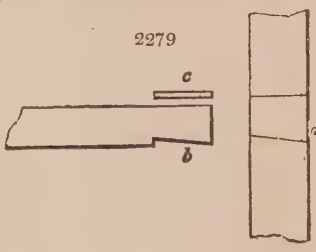
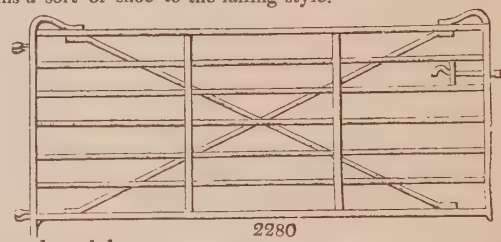


2488. *Cottam's Iron Field Gate*, fig. 2280., has not been surpassed for strength of construction or durability of material. It is made of wrought iron, and the horizontal bars and braces are of flat bar iron, riveted together at every intersection, in order to prevent the swagging or sinking of the head. The cost singly is 26*s*., but by the dozen it will be charged much less.



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2489. *Buist's Fan Wire Gate*, fig. 2281., is at once light, strong, and economical. The wires which constitute the fan are fastened at their outer extremities by being driven up like nail heads; and at the point of their convergence, at the upper hinge of the gate, they are screwed up tight by nuts. The gate is so close as to be nearly game-proof, and so strong, that one of the form shown in the figure, with a weight of eight hundred and sixty pounds at its extremity, after being made to swing for some time to and fro, did not undergo the slightest alteration in shape. The weight of this gate is from eighty-five pounds to ninety-five pounds, and its cost from £1 15*s*. to £2. The same principle is equally applicable to toll-bars as to park gates; and, indeed, is the more important in its uses the more extended is the span of the gate. Fig. 2282. is a park gate with wickets on

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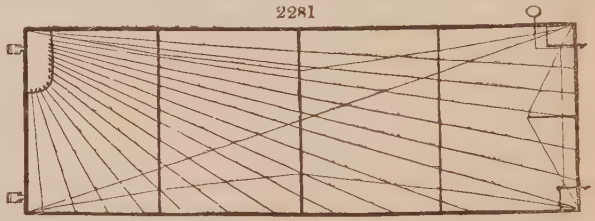

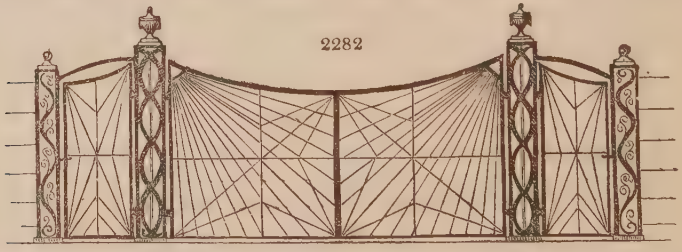

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this plan. The span of the gate is twelve feet; the wickets are two feet and a half wide and six feet high. The supporters may be made of open iron castings. The wickets could be made for about 18*s*. a piece, the gate itself for £4; or £5 10*s*. in all: a very small fraction indeed of the price commonly paid for park gates of similar appearance and show. Much depends on the excellence of the workmanship of these gates, and Mr. Buist the inventor, now in Bombay, strongly recommends Mr. John Douglas, blacksmith, Cupar, Fifeshire. (See also *Gard. Mag.* for 1840, p. 193.)

2490. *A fall-down Gate-stopper*, fig. 2283. Where double gates are used, the gate-stopper standing up in the middle of the road or walk is a great nuisance, both to men and horses, but, by having the stopper to work on pivots, as in the figure, it can be raised up when the gate is shut, as at *a*, and turned down when it is open, as at *b*. These stoppers are the invention of Messrs. Cottam and Hallen.

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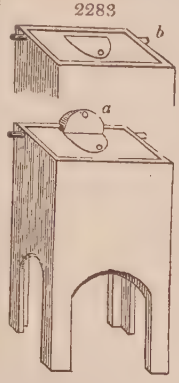
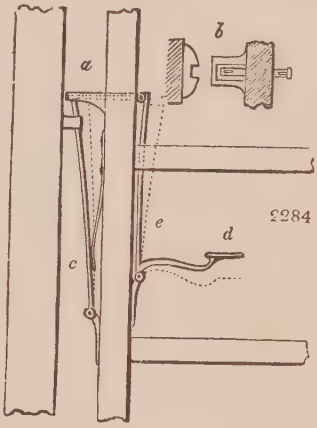


2491. *A Gate Latch*, which cannot be shaken out by cattle, is represented in fig. 2284., in which *a* is a side view, and *b* a transverse section. The upright latch, *c*, is held in the catch by a spring, so that it cannot easily be shaken out by the rubbing of cattle, or the shaking of boys or idle persons, while it can be easily opened by a person on horseback placing the end of his whip or stick in the hollow thumb-piece *d*, which, acting as a lever on the upright piece *e*, pulls back *c*, and compresses the spring, by which the gate is readily opened.



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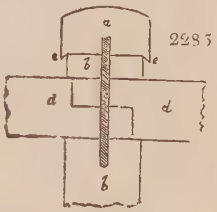
2492. *A Cap for the upper Rail of a Wooden Fence*, in which no nails are to be used, is shown in the section fig. 2285., in which *a* is the cap, having one end of a strong wooden pin, *c*, driven tight into it; *e e*, the angles of the cap, formed so as to drip the water clear of the rails; *d d*, the rails, overlaid and fastened in the post *b* by the pin *c*. The other rails need not have any fastening, further than being halved and overlaid, as the bottom end of the post is fast in the ground. Some very handsome designs for rustic fencing and gates, by Mr. Ricauti, will be found in the *Gardener's Magazine* for 1842; but more especially in Ricauti's *Sketches for Rustic Work*, now publishing.



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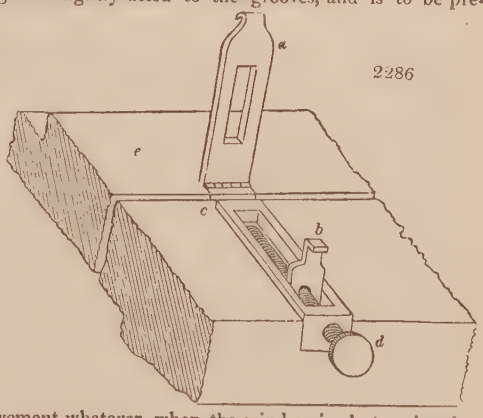
Sect. IX. *Miscellaneous Details.*

2493. *To prevent Sash-Windows from shaking and rattling with the Wind.* This evil arises from the sashes not having been tightly fitted to the grooves, and is to be prevented by tightening them, which may be done in two ways. The most common is by a sash-fastener, fig. 2286., one part of which, *e*, is screwed to the side of the lower rail of the upper sash, and the other part, *b c d*, to the upper side of the upper rail of the lower sash. Then the part *a* being brought down over the part *b*, which travels backwards and forwards in the box *c*, is made tight by the thumb-screw *d*. In this way both sashes are drawn to press against the parting bead which separates the two sashes, and, in consequence, they are effectually prevented from shaking, or from any lateral or perpendicular movement whatever, when the window is shut. Another mode of effecting the same object, and keeping the sashes from shaking, whether the window is shut or open, is by inserting a double bead of well-seasoned oak in the groove of the window case in which the sash moves up and down. This is shown in fig. 2287. at *a*; and, as the style of the sash moves up and down on this



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bead, it is kept firmly in its place, altogether independently of the parting beads or the outside beads. The situation of the outer sash is shown at *b*, and it works on a similar double bead; *d* is the boxed frame for the shutters inside the room; *e* is the box for the weights; *f*, the brick forming the outside jamb of the window; and *c*, the outside sill. This is a very effectual mode of preventing large old windows from shaking, whether open or shut, but it is rather expensive.

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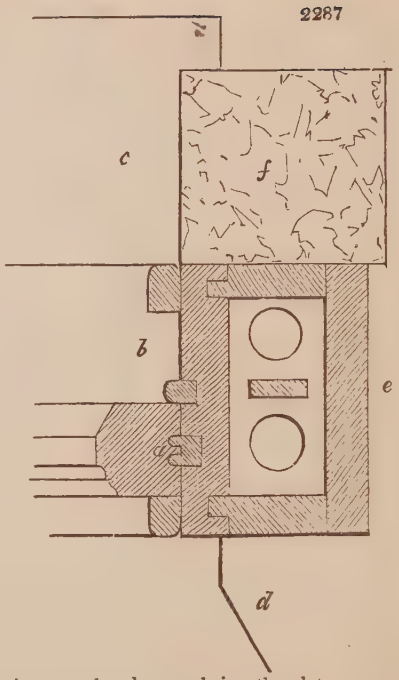

2494. *A Hinge for a Jib-door.* A jib-door is a door which opens either by being pushed from, or drawn towards, the opener, and which, after being opened, shuts of itself. The action of these doors is founded on the construction and application of their hinges, and hence various forms have been adopted, aided by springs in some cases, and weights and pulleys in others. But the cheapest, and that which operates with the greatest ease, is the one which we are about to describe. The top hinge of the door is merely a pivot, which works in a projecting eye; and the folding-hinge is fixed on the lower part, or heel, of the hanging-style of the door.

Fig. 2288. is a general view of the folding bent hinge, before being screwed on to the door; *c* being the plate screwed to the jamb, and *b* that screwed to the style, both parts being connected by *a*. It may be made either of cast iron or of brass. Fig. 2289. is a horizontal section through the

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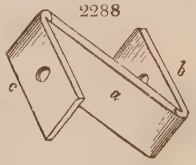

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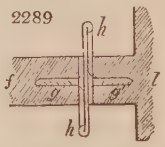

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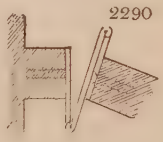
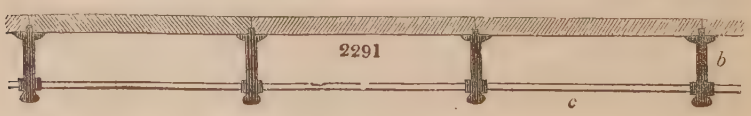


hinge when the door is shut, in which *l* is the jamb; *f*, the style of the door; *g g*, screws; and *h h*, parts of the folding hinge which project beyond the door on each side. Fig. 2290. is a horizontal section, showing the door partially opened.

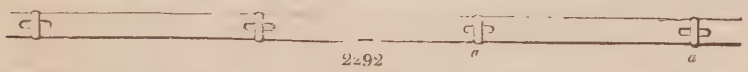
2495. *Lath and Plaster Partitions*, when open from the bottom or from any floor of the house, admit of a current of air from bottom to top, and in the case of fire greatly accelerate its progress. It is, therefore, recommended to fill them in solid behind the skirtings of the rooms, which can readily be done by common mortar, with fragments of tiles or bricks, or by cement.

2496. *Fire-proof Floors and Partition Walls.* Much might be done to effect these objects by iron joisting, laid two feet or thirty inches asunder, and covered with Caithness flags, the flattest, the hardest, and the most tenacious of this class of stones. They are incapable of being cut by masons' irons, but they saw easily; and, being truly flat by nature, they require no farther dressing than being sawn square. They are found of all thicknesses, from a quarter of an inch to three inches and a half, and are so strong at two inches thick that no accident which can occur, in ordinary cases, could injure a square of thirty inches, or even three feet. If, therefore joists of iron, as shown in section fig. 2291. (in which *a* is the line of flag-stones forming the floor; *b*, the cast-iron



joists; and *c*, the wrought-iron rod for stiffening them), were covered with these flags a substantial fire-proof floor might be made of any extent. In many cases, the natural surface of the stone may do; but, in conspicuous places, where neither carpet nor oil-cloth is laid down, the slabs may be polished by rubbing one against another, and, when finished in this way and oiled, they look as well as Tournay marble. Sir John Robison heated a portion of this stone red hot, and quenched it in water, without its cracking, or appearing to lose its peculiar tenacity. This stone may be had in London of Messrs. Freeman, Milbank Street, Westminster.

2497. Thin fire-proof partitions with Caithness stone, or with Arbroath stone, may thus be formed. Suppose a set of upright iron standards, like *a a* or *b b*, in the horizontal sections figs. 2292. and 2293., were erected, and stone slabs, grooved or plain



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(according to circumstances), were dropped into the spaces, a very firm partition might be built up, without requiring any fastening, except the top course, where, of

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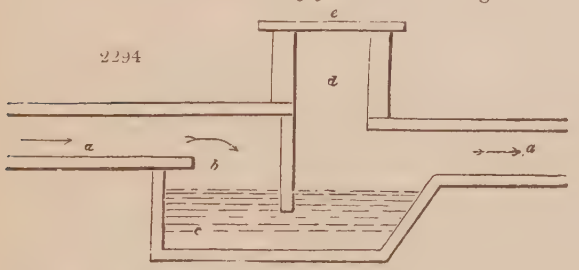
necessity, there could be no feather or ledge, as all the stones would have to be let in there. Other and better forms would probably occur on further consideration. — *J. R.*

2498. *Windows in Roofs.* In introducing windows in roofs, care should be taken that the panes of glass are flat, and not in any way globular, like what are called bull's-eyes, it having been found that a house was set on fire by a bull's-eye being introduced in the roof, in order to light a garret. The bull's-eye concentrated the sun's rays on a muslin dress lying exposed on a large box beneath. From the flame communicating to the box, its contents were soon set on fire, and the flooring and rafters were in a short time completely in flames. This happened in the house of a gentleman on the Stroud road, near Gloucester. (*Scotsman*, Aug. 3. 1839.)

2499. *An Air and Vermin Trap for Drains.* In fig. 2294. *a a* represent the drain, the bottom of which is straight or circular, as the case may be; but it projects at *b* over the water in the trap *c*, from three inches to six inches, which prevents the vermin from passing one way, as will be perceived. The level of the water in the trap is several inches below the under side of the bottom of the drain. (*A. M.*, iii. 192.)



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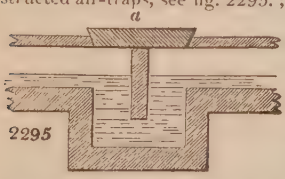
2500. *To guard against Mice and Rats.* The aliment of mice and rats consists of nearly equal food and water. In farmeries the first cannot be withheld, but the latter may. All drains should be made of close-jointed stone, or of bricks, with properly constructed air-traps, see fig. 2295.; in which *a* is a stone, which is made to lift up, to clean out the earth or other matter from the trap. Roof gutters, if any, should be made as inaccessible as possible; water troughs decidedly so. This is easily done. Project a wooden fillet, or frame, all round within the trough, making it project three inches or thereabouts into the trough, and keep the surface of the water about three inches below the frame. By this method no rat of the ordinary size can get a drop. To prevent them from getting up into the roof, let a flagstone be projected over each of the interior angles. No walls, especially of dry stone, should be allowed near the buildings; or, at least, to come in contact with them near the level of the walls.—*I. M.*



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Sect. X. *Materials.*

2501. *Cements.* Various kinds of cements have been introduced since the Encyclopædia was published, but none surpass that variety of the old Roman cement called the Mulgrave Cement, and sometimes Atkinson's Cement. It is double the price of

the common Roman cement, but it is proportionately superior in point of strength and durability. As a proof, we may mention that houses built of stone in the neighbourhood of Whitby, and, among others, Mulgrave Castle, have been covered with it, to protect the stone from the effects of the sea air. In our opinion, the walls of a house built of brick, and covered with good cement, are far stronger than walls of brick with outside casings of stone. In all cases, therefore, where walls of great strength and durability were required, and where they could not be built wholly of stone, we should build them of brick, either laid in cement or covered with it. The facility which cement affords of introducing architectural forms, such as architraves, cornices, &c., at little expense, requires no eulogium, since it has contributed more than any thing else to the present highly improved state of British architecture. When plain walls are covered with cement, the surface ought always to be marked by lines, so as to give the expression of stone; and this imitation of stone ought not to be confined to stone with a smoothly hewn surface, as it generally is at present, but every manner of hewing stone ought to be imitated, including plain ashlar, tooled ashlar, random-tooled, chiseled, boasted, pointed, rusticated, frosted, scappeld, hammer-dressed, &c.

2502. *A Metallic Cement*, formed of powdered scoria from copper-works and stone lime, sets rapidly, and takes a fine metallic polish. It is sold in powder, mixed in due proportions; price 9*d.* per bushel. (*A. M.*, i. 46.)

2503. *Asphalte, Caithness Stone, and Slate.* Asphalte, as a material of recent introduction, and its various uses, have already been noticed (§ 2447.), as has Caithness stone (§ 2496.). Slate is coming into very general use for shelves to pantries, dairies, &c.; for kitchen tables, for panels to doors, for flooring to rooms, and for a great variety of other purposes. A layer of asphalte in a wall is found as effective in preventing the rising of damp as a course of slate or flagstone, or a layer of Roman cement. Caithness flagstone is at last acknowledged by some of the first architects, both in Scotland and England, to be superior to all others for works in the open air. "As regards strength and hardness, it is not to be equalled by any paving-stone used in London: it completely resists the action of the severest frosts; it neither scales, flakes, nor becomes slippery; and, from not being porous, it dries rapidly after rains: in fact, none of the objections so common to the Yorkshire paving, or any other freestone, seem to apply to the Castlehill Caithness paving. The method of squaring the stone, with sawn joints, is also of great advantage, by securing a close joint, and thereby contributing to the solidity and ornament of the work."

2504. *Cylindrical Earthenware Tubes for Flues* are in general use in building all good houses in the North of England and in Scotland. The cylinders are about ten inches in diameter, one foot in length, and an inch in thickness; one end of every cylinder being rectangular, and the other oblique, in order to admit of building the flues either straight or curved at pleasure. When they are to be built curved, the oblique ends are joined to straight ends, and when they are to be built straight, the oblique ends and straight ends are put together alternately. The great advantage of this kind of flue is, that it is easily swept by machinery, and that much less soot adheres to the sides than in square flues. A series of bricks of different forms, for effecting the same purpose, has lately been invented by Mr. Welch, architect, Liverpool.

2505. *Sheet Glass for Windows*, and especially for sashes for greenhouses, has recently come into use. This glass is thicker than common crown glass, though not much dearer, and it can be obtained in panes of any length under six feet, and of any breadth under two feet. It has been extensively used at Chatsworth, both in the roofs of hothouses and in the windows of cottages. Its great advantage for hothouse roofs, and sashes for garden frames of every kind, is, that very few joints are required, and hence the heated air within is prevented from escaping, and the rain from being driven in. In short, the introduction of this glass into hothouse buildings is one of the greatest improvements that have been made in their construction since the substitution of roofs of glass for roofs of opaque materials. Where the ridge and furrow mode of forming hothouse roofs is adopted, there need not be a single glass joint in the entire roof. Verandas may be glazed without joints, by using panes of the full length, and the advantage, both in point of beauty, admission of light, and saving of breakage, is incredible, as we have proved in our veranda here. This glass is manufactured by different persons, and we can very strongly recommend Messrs. Claudet and Houghton, Holborn.

2506. *Plate Glass*, when it is to be ground on the surface, may be obtained of the manufacturers at a very moderate rate, because the slightest defect in the material unfits it for being polished, but is no drawback to its being ground. The ceilings of lobbies, passages, and all rooms having skylights, may be finished with this glass below the skylight with admirable effect, as may be seen in the houses of various gentlemen in Newcastle, Liverpool, and Edinburgh. The same damaged glass, without being ground, is admirably adapted for cottage windows, not only because it is not easily broken, but

because from its thickness it is a very bad conductor of heat, and might almost serve as a substitute for window-shutters.

2507. *Preservation of Wood.* Sulphate of copper, which abounds in the mineral waters of the mines in Cornwall and Anglesea, has been proved to be an excellent preservative of timber which has been immersed in it. (See *Mech. Mag.*, vol. xxxiii. p. 568., and *Gard. Mag.* for 1842, p. 174.)

In the last work the following recipe is given for preparing the composition:— Take fifteen pounds of sulphate of iron (7*s.* 6*d.* per hundredweight); twelve pounds of sulphate of copper (45*s.* per hundredweight); twenty-four pounds of sulphate of zinc (45*s.* per hundredweight); one quart of sulphuric acid (3*d.* per pound). The sulphates to be well pounded, and dissolved in hot water; and then the sulphuric acid to be mixed in the solution, and well stirred up with a scrubbing-broom. The above, added to thirty-six gallons of water, is ready for the tank. Time of saturation: for one-inch board, three days; three-inch plank, or scantling, seven days; five-inch to six and seven inch scantling, all twelve to fourteen days; large timber, twelve inches to fourteen inches square, will require twenty-one days.

Creosote has been employed for ages in the preservation of animal structures for anatomical purposes, and is found also the most effective in preserving timber. Mr. Bethel's mode of preservation consists in impregnating the wood to the centre with this substance. (*Mech. Mag.*, vol. xxxi. p. 309.)

2508. *Ironwork coated with Gas Liquor, Tar, or Pitch,* is found to be far less durable than when painted with lead and oil in the usual manner. The oxidation is greatly accelerated in a damp situation, but it takes place even in coal-scuttles kept in dry rooms: of course this does not render gas liquor, tar, or pitch, less fit for preserving wood. (*Gard. Mag.*, 1840, p. 514.)

Chap. VI.

Fittings-up, Finishing, and Furnishing.

Sect. I. *Modes of Heating.*

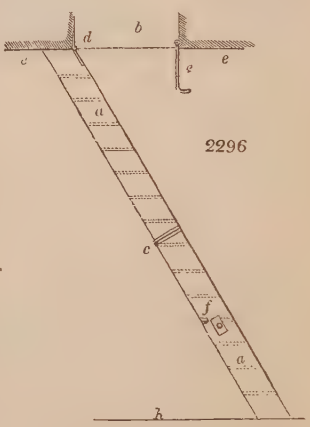
2509. *Many different Kinds of Stoves* for heating the general air of a house have been invented or brought into notice within the last seven years. Among these, the more remarkable are Arnot's and Joyce's stoves. The latter needs only to be mentioned to be avoided; since, in effect, it is nothing more than burning charcoal without a flue to carry off the fumes, the deleterious effects of which are so frequently exemplified in the case of suicides. Arnot's stove is unquestionably the best apparatus of the kind that has yet appeared, since the quantity of heat produced is regulated with the greatest nicety; the fuel, in consequence of being burned in an enclosure of fire-brick, is thoroughly consumed, and, by regulating the supply of air, but a small proportion of heat is allowed to escape with the smoke. For the halls or passages of small houses, and for large rooms, in addition to open fires, Arnot's stove is therefore one of the best; but it must be borne in mind that it introduces no fresh air, and is therefore altogether unsuitable in cases where ventilation is to be combined with warming. For this purpose it is essential that a stream of fresh air should be introduced from without, as in Strutt's stove (§ 2530.), and be heated by the stove before being allowed to escape into the apartment. This has been effected by many different stoves, and with Arnot's stove, by a modification introduced by Mr. Jeakes. An excellent ventilating stove, combining an open fireplace, has also been invented by Mr. Jeffery, the inventor of the respirator, and may be seen in action at No. 148. Regent Street. The stoves of Mr. White, already mentioned (§ 2478.), are calculated either to heat the air of the apartment, by passing it through a flue or case, or to heat the external air by the same means. There are various other stoves; such as the Chunk stove, Kirkwood's stove, the Vesta stove, Brown and Green's ventilating stove, the Olmsted stove, &c., but the three which deserve the preference, in our opinion, are: Arnot's stove, alone for a small house, or with Jeakes's improvement for a larger house; White of Haddington's warm-air stove, and Jeffery's warm-air stove, where it is desired to combine an open fireplace. The price of one of White's stoves of the smallest size is £3 10*s.*, which is about the same price as Arnot's stove without Jeakes's improvement: Jeffery's stove is much dearer. The great merit of Dr. Arnot's stove consists in the saving of fuel; but, as ventilation by this stove depends solely on combustion, it is diminished in proportion to the saving. It can never, therefore, be recommended as the sole means of warming living-rooms; but for halls and staircases, or small houses where outer doors are being constantly opened,

it will be found more economical than any other. To derive the full benefit from Arnot's stove, the outer casing ought to be of sheet iron, in order to disperse the heat generated as rapidly as possible; for, when cast-iron casings are used, great part of the heat is carried up the chimney. In large houses, we repeat, White's stove deserves the preference. It may be some recommendation of this stove, to mention that it is the only one introduced into his new buildings by Mr. Burn, the most extensively employed architect in Scotland. Much discussion on Dr. Arnot's stove, and on the others mentioned, will be found in the *Architectural Magazine*.

2510. *Heating the general Atmosphere of a House by Hot Water* is occasionally resorted to, as producing a more agreeable heat, from the moisture it contains, than dry air, which, when too dry, abstracts moisture from the skin, and also as not admitting of overheating the air by the apparatus. This mode of heating is variously effected, but the best apparatus for the purpose, in our opinion, is that of Price and Manby of Nelson Street, Bristol, and of Chester Place, London. The air is heated in a cellar by a series of shallow flat closed vessels, or cases, of hot water, and rises through a trunk or flue in the same manner as by Mr. Sylvester's mode (§ 2379.). As the air by this mode can never be heated much above 100°, the risk of fires from the apparatus is much less than by any mode of heating by a stove or cockle.

Sect. II. *Interior Fittings-up and Finishing.*

2511. *Fittings-up of Cottages.* It has been suggested by the Highland Society, that, if doors, shelving, and other wooden work for cottages, could be manufactured in the wholesale way, like M'Culloch's windows, it would materially lessen the expense. We have suggested in the *Gardener's Magazine* the idea of manufacturing cottage fittings-up and furniture in Norway, and importing them in a state fit for use. Were there a sufficient demand, the manufacture would be carried on as regularly as that of Norway battens, and the saving to the builders and occupiers of cottages would be very great.



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2512. *A Fold-up Step-Ladder* is often a convenient substitute for a stair in cottages. Fig. 2296. shows a ladder of this description hinged at *d*, and with a joint at *c*. When folded up it has the appearance shown in fig. 2297., there being a stud at *f* which rests on the hook *e*.

2513. *Cowell's Sash-Suspender* enables sash-windows to be cleaned, painted, or repaired, without the operator's going outside for these purposes. The line by which the sash is suspended, instead of being nailed to it, is secured in a socket provided with a hook. To this is fitted a plate or eye, which is let into the sash, so that it can be attached or detached in an instant, and with the greatest ease. A complete set of the brass suspenders, including an ingenious brass bolt for fixing the bead, instead of nailing it, costs only 3*s*. 6*d*. (See the figures of this invention, and farther details, in *Arch. Mag.*, vol. iv. p. 72.)

2297

2514. *The Rollers of Window-Blinds*, formerly made cylindrical, are now made octagonal or polygonal, which is found to give them a better hold of the blind or other material to be rolled round them than cylindrical rollers. A pulley-rack for blinds, invented by Messrs. Loach and Clarke, is considered a very great improvement, as is a wedge-fastener by the same party. We have tried both, and consider the pulley-rack very superior to that in common use.

2515. *Preserving the Tapes of Venetian Blinds from the Sun.* This object is attained by two slips of wood the length of the blind, connected as a parallel ruler, and screwed within the frame of the blind upon both sides. When the blind is about to be let down, the preserver is drawn out, and the slip of wood covers the whole of the tape, which would be otherwise exposed to the action of the sun. By this simplest of all contrivances, the durability of the blind is insured for a considerable period.

2516. *Venetian Blinds made of Glass instead of Wood* have recently been invented, and may come into occasional use in dwelling-houses, water-closets, &c. (*A. M.*, iv. 206.)

2517. *The Poor Man's Window-Blind.* The simple homely furniture of the poor cottager requires to be protected from the scorching rays of the noonday sun as much as

the more elaborately finished articles which occupy the apartments of the citizen and tradesman; but the expense of the roller, the pulleys, the trap-rack or slide, the stretching-rod and line, as well as the holland (cotton cloth not being capable of being rolled evenly), places that description of window-blinds which is generally used beyond the means of the poor labourer; therefore a simple window-blind may be made as follows. After a piece of cheap thin calico of the proper size has been hemmed, attach a few small rings to the upper edge; fix a nail on each side of the window case at the top, and extend a strong piece of cord across, on which the blind is to be hung in the manner of bed-curtains. A small string is then attached to the last ring on the left side, and hanging down on the same side, to pull the curtain on the window; and another string is to be fixed to the same ring, but passing through all the other rings, and hanging down on the right side, to pull the curtain off. Each of the two strings to have a small ring fixed at the ends, by way of finish to them; and if the labourer has a tidy wife, she will not fail to make a little frill or vallance, with a loop at each end, to hang upon the nails, so as to hide the working of the rings. The whole would not, for an ordinary-sized cottage window, cost above 10*d.*—*S.*

2518. *Painting and Papering, as Modes of Finishing, compared, with Reference to Salubrity.* Of all the arts connected with domestic comfort, there is scarcely one on which so little has been written, and consequently of which so little is known, as house-painting. It is well understood that the ceilings and walls of all the apartments of dwelling-houses and other buildings, in this country, are now almost uniformly finished in plaster; and the nature and properties of this composition are also well known. One of these properties is its power of absorbing moisture, or, in other words, its facility in attracting and imbibing dampness. Consequently, when an apartment is left for any length of time without the benefit of a fire, or of heated air supplied by other means, the plaster will continue to absorb a portion of the dampness from the atmosphere with which the room is filled; and it is natural to suppose that, when a fire is put on, or heated air is otherwise admitted, this dampness will be gradually given out by exhalation from the plaster. This process of exhalation must affect the durability, not only of the plaster itself, but of the woodwork under it, and must also render the apartment much less comfortable than if it had been rendered incapable of such absorption. It therefore becomes an enquiry of some interest, whether painting or papering (the two methods by which the walls of our apartments are usually decorated) is the better adapted to counteract these disadvantages.

2519. *The Process of painting Plaster-work* is as follows. White lead and linseed oil, with a little litharge to facilitate the drying, are mixed together to about the consistence of thin cream; a coating of this being applied, the oil from it is sucked into the plaster in the course of a few hours, leaving the white lead apparently dry upon the surface. In the course of a day or two, when this coat has sufficiently hardened, another is given a few degrees thicker, the oil from which is partially absorbed according to the nature of the plaster. In the course of a few days more a third coat is applied. This coat is made pretty thick; and, if the absorption of the oil from the second coat has not been great, about one fourth of spirits of turpentine is added; but when the absorption has been great a less proportion of the spirits of turpentine is employed. Into this coat are put the colouring ingredients, to bring it near the shade intended for the finishing coat. Should the plaster now be thoroughly saturated, the flatting or finishing coat is applied; before this is done, however, a fourth coat, thinned with equal portions of oil and spirits of turpentine, is generally given, particularly when the work is wished to be of the most durable kind. The flatting, or finishing coat, is composed entirely of paint; that is, of white lead, and the colouring ingredients mixed together, and ground in oil to an impalpable paste. This mixture is of a very thick consistency, and must be thinned with spirits of turpentine until it will flow easily from the brush. The spirits of turpentine, being very volatile, evaporate entirely, leaving the surface of the paint of a very compact and hard nature. By this process, the plaster is rendered incapable of absorption; and the surface of it is hardened by the oil which it has sucked in from the first and second coats, and is thereby rendered less liable to breakage, with the great advantage of being washable.

2520. *Paper-hangings.* It now remains to be seen whether paper-hangings are equally well adapted to the comfort, cleanliness, and durability of the generality of apartments, as a decoration for plastered walls. Every one knows that paper is more or less absorbent, according to its quality. When it is manufactured into paper-hangings, it is washed over with a coating of size colour, equally absorbent with the paper itself, upon which a pattern is stamped with the same material. To prepare the plaster for papering, it receives a coating of a weak solution of glue in water; and the paper, as every one knows, is fixed on the wall by paste. Paper-hangings, therefore, cannot be considered, in a general point of view, as being so well adapted to plastered

walls as paint; and there are particular situations in which serious disadvantages attend paper, which a short explanation will make apparent to every one. Take a dining-room for example. The papered wall has nothing in it to resist the absorption of the steam of the dinner, or breaths of the large parties by which it is often crowded: the glue and paste used in paper-hanging must be thereby softened, and the moisture absorbed must, of course, be afterwards gradually given out in connexion with the natural effluvia of these, the former of which all know to be extracted from animal substances, not of the most cleanly nature, until the wall be again thoroughly dry. Besides, a papered wall is liable to be injured past remedy by so common a casualty as the starting of a bottle of table-beer, champagne, or soda-water. Lobbies and staircases are sometimes papered, although the practice is not very common in Scotland. This is very objectionable, as the condensation of the atmosphere, which always takes place upon the walls of such apartments on a change of temperature, from cold to warmth, must be absorbed, and again given out as before explained. They are likewise very liable to accidental injuries, and should therefore have the hardest and most impervious covering. In regard to drawingrooms and bed-rooms, these particular objections to paper-hangings do not apply, yet there are modes of painting drawing-rooms superior, not only in point of utility (to which for the present these observations are confined), but also in effect.—*D. R. Hay.* Mr. Hay is at the head of his profession in Scotland; and we are happy to be able to state that Mr. Moxon, who has been for several years in Mr. Hay's establishment, and is equally enthusiastic in his art, has recently commenced business in High Street, Marylebone, London. Mr. Moxon is the author of the *Grainer's Guide*, folio, £2 2*s*., a work by far the best of its kind which has yet appeared.

2521. *Principles of papering Rooms.* The following remarks are by Mr. Pugin. "I will commence with what are termed Gothic pattern papers, for hanging walls, where a wretched caricature of a pointed building is repeated from the skirting to the cornice in glorious confusion; door over pinnacle, and pinnacle over door. This is a great favourite with hotel and tavern keepers. Again, those papers which are shaded are defective in principle; for, as a paper is hung round a room, the ornament must frequently be shadowed on the light side. The variety of these miserable patterns is quite surprising; and as the expense of cutting a block for a bad figure is equal, if not greater, than for a good one, there is not the shadow of an excuse for their continual reproduction. A moment's reflection must show the extreme absurdity of repeating a perspective over a large surface with some hundred different points of sight: a panel or wall may be enriched and decorated at pleasure, but it should always be treated in a consistent manner. Flock papers are admirable substitutes for the ancient hangings, but then they must consist of a pattern without shadow, with the forms relieved by the introduction of harmonious colours. Illuminated manuscripts of the thirteenth, fourteenth, and fifteenth centuries would furnish an immense number of exquisite designs for this purpose."—*Pugin.*

2522. *Carpets.* These observations will apply to modern carpets, the patterns of which are generally shaded. Nothing can be more ridiculous than an apparently reversed groining to walk upon, or highly relieved foliage and perforated tracery for the decoration of a floor. The ancient paving tiles are quite consistent with their purpose, being merely ornamented with a pattern not produced by any apparent relief, but only by contrast of colour; and carpets should be treated in precisely the same manner. Turkey carpets, which are by far the handsomest now manufactured, have no shadow in their pattern, but merely an intricate combination of coloured intersections.

2523. *Curtains.* Modern upholstery, again, is made a surprising vehicle for bad and paltry taste, especially when any thing very fine is attempted. To arrange curtains consistently with true taste, their use and intention should always be considered: they are suspended across windows and other openings to exclude cold and wind, and, as they are not always required to be drawn, they are hung to rings sliding on rods, to be opened or closed at pleasure: as there must necessarily be "a space between this rod and the ceiling, through which wind will pass, a boxing of wood has been contrived, in front of which a valance is suspended to exclude air. Now the materials of these curtains may be rich or plain, they may be heavily or lightly fringed, they may be embroidered with heraldic charges or not, according to the locality where they are to be hung, but their real use must be strictly maintained. Hence all the modern plans of suspending enormous folds of stuff over poles, as if for the purpose of sale or of being dried, is quite contrary to the use and intentions of curtains, and [therefore] abominable in taste; and the only object that these endless festoons and bunchy tassels can answer is, to swell the bills and profits of the upholsterers, who are the inventors of these extravagant and ugly draperies, which are not only useless in protecting the chamber from cold, but are the depositories of thick layers of dust, and in London not unfrequently become the strong-

holds of vermin. It is not less ridiculous to see canopies of tomb and altar screens set up over windows, instead of the appropriate valance or baldaquin of the olden time. It is proper in this place to explain the origin and proper application of fringes, which is but little understood. Fringe was originally nothing more than the ragged edge of the stuff, tied into bunches to prevent it unravelling further. This suggested the idea of manufacturing fringe as an ornamental edging, but good taste requires that it should be both designed and applied consistently.

1. In the first place, fringe should never consist of heavy parts, but simply of threads, tied into ornamental patterns.

2. Secondly, a deep fringe should not be suspended to a narrow valance.

3. Thirdly, no valance should be formed entirely of fringe, as fringe can only be supplied as an ornamental edging to some kind of stuff.

4. Fourthly, fringe should not be sewed upon stuff, but always on the edges. It is allowable at the very top, as it may be supposed to be the upper edge turned over." (*Pugin's Christ. Arch.*, p 29.)

2524. *Metal-work.* The Gothic architects, Mr. Pugin informs us, suited the design to the material with which they worked; and instead of concealing construction, they avowed and decorated it, whether in the elevation of a house, or in the smallest article of furniture. Hinges, locks, bolts, nails, &c., which are always concealed in modern designs, were, in pointed architecture, rendered rich and beautiful decorations, not only in doors and fittings, but in the smallest cabinets. The hinges, in former times, covered the whole face of the doors with varied and flowing scroll-work; and such hinges were not less beautiful in design than they were practically good, by extending the whole length of the door, and being bolted through it in various places. Stock-locks were also avowed, and rendered very ornamental, but now they are concealed, by being let into the styles of doors, which are often cut more than half through to receive them. "A lock was a subject on which the ancient smiths delighted to exercise the utmost resources of their art. Keys were also highly ornamented with appropriate decorations referring to the locks to which they belong." (*Pugin's Christ. Arch.*, p. 21.)

2525. *Cast Iron-work*, when viewed with reference to mechanical purposes, Mr. Pugin observes, "must be considered as a most valuable invention, but it can but rarely be applied to ornamental purposes. Iron is so much stronger a material than stone, that it requires, of course, a much smaller substance to attain equal strength; hence, to be consistent, the mullions of cast-iron tracery might be so reduced as to look painfully thin, devoid of shadow, and out of all proportion to the openings in which they are fixed. If, to overcome these objections, the castings are made of the same dimensions as stone, a great inconsistency with respect to the material is incurred; and, what will be a much more powerful argument with most people, treble the cost of the usual material. Moreover, all castings must be deficient of that play of light and shade consequent on bold relief and deep sinkings, so essential to produce a good effect. Cast iron is likewise a source of continual repetition, subversive of the variety and imagination exhibited in pointed design. A mould for casting is an expensive thing; once got, it must be worked out Hence we see the same window in greenhouse, gate-house, church, and room; the same strawberry-leaf, sometimes perpendicular, sometimes horizontal, sometimes suspended, sometimes on end; although, by the principles of pure design, these various positions require to be differently treated. Cast iron is a deception; it is seldom or never left as iron. It is disguised by paint, either as stone, wood, or marble. This is a mere trick, and the severity of Christian, or pointed, architecture is utterly opposed to all deception; better is it to do a little, substantially and consistently with truth, than to produce a great but false show: cheap deceptions of magnificence encourage persons to assume a semblance of decoration far beyond either their means or their station, and it is to this cause we may assign all that mockery of splendour which pervades even the dwellings of the lower classes of society. Glaring, showy, and meretricious ornament was never so much in vogue as at present; it disgraces every branch of our arts and manufactures, and the correction of it should be an earnest consideration with every person who desires to see the real principles of art restored." (*Pugin's Christ. Arch.*, p. 30.)

2526. *The Manner in which Fenders are fitted to Fireplaces* is almost everywhere unarchitectural; and there is not a single feature in the interior of living-rooms that is more in want of reformation. The meagre iron or brass rim of the fender abuts abruptly against the marble plinth of the chimney jambs, sometimes against the middle of the plinth, and sometimes against one side. There is nothing either in the jambs or in the fender to show that they are intended to be joined together; nothing to indicate whether the rim of the fender should abut against the jamb of the grate, middle of the plinth, or its outer edge; or whether it should not abut on the front of the grate within the jamb altogether. It is astonishing that so glaring a defect in the adaptation of furniture should so long have escaped the notice of architects, and that it should still

prevail in some of the most magnificent houses in Britain; for example, in Windsor Castle and Hamilton Palace, in both of which the principal rooms have lately been newly fitted up and furnished in the most splendid style. There are various ways in which this evil might be remedied. 1. The fender being of metal, might be so contrived as to fix into and connect architecturally with the grate, as being also of metal. 2. Grooves or recesses may be made in the plinths of the jambs, into which boxings of metal might be fixed, and into these the fender might be made to drop, and be taken out at pleasure; or projections from the jambs might be made, either in marble or metal, extending on the hearth as far as might be necessary, and between these the fender might be dropped in. An idea of this mode may be formed from fig. 2298. In

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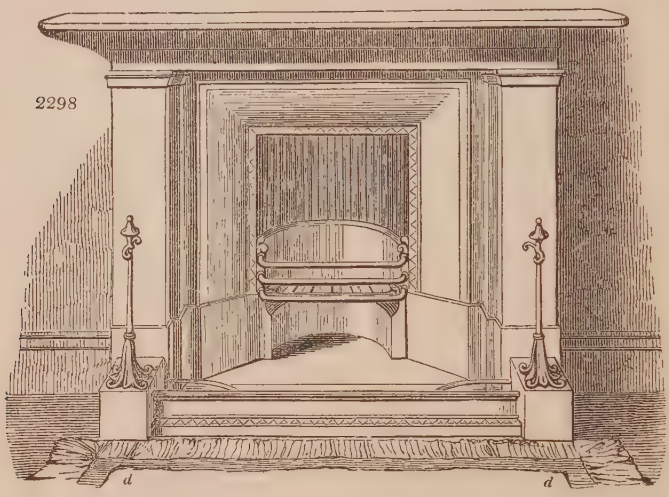


this figure the two projecting blocks may be of marble, stone, or of cast iron, hollow; and they may be attached to the hearth by two wooden pins in the under sides of the blocks, which should drop into two small holes in the hearth. On the blocks might be raised the supports to the fire-irons, as shown in the figure. Some further discussion on the adaptation of fenders to fireplaces will be found in the *Suburban Architect and Landscape-Gardener*, p. 125. to 127.; and we would strongly recommend the subject to the attention of architects, convinced that, if they were to see this deformity in the light we do, the evil would soon disappear, at least in first-rate houses and palaces.

2527. *Cornices, Ornaments in Papier-Maché, and various Architectural and Sculptural Details*, are now very generally introduced in interior finishing. The principal manufacturer is Mr. Bielfield of Wellington Street, who has published several books of cornices and ornaments, and other details, from which selections may be made.

2528. *The Italian Mode of excluding the common House-Fly from Apartments*, and which is as old as the time of Herodotus, is simply to cover the openings of the windows by a net of white or light-coloured thread. It is remarkable that the meshes of this net may be an inch or more in diameter, so that there is actually no physical obstacle presented to the entrance of the flies, even with expanded wings. The flies seem to be deterred from entering from some inexplicable dread of venturing within the network. It is even found that "if small nails be fixed all round the window-frame, at the distance of about an inch from each other, and threads be then stretched across both vertically and horizontally, the apparatus will be equally effectual in excluding the flies." It is essential, however, that the light should enter the room on one side of it only; for if there be a thorough light, either from an opposite or side window, the flies pass through the net without scruple. (*Trans. Ent. Soc.*)

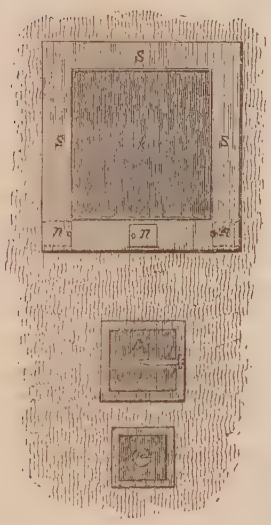
Sect. III. *Kitchen Fittings-up and Furniture.*

2529 *Various Ovens and Kitchen-Ranges* have been brought into notice since the Encyclopædia appeared; but no oven has equalled that of Count Rumford as modified by W. Strutt, Esq., a man of most extraordinary genius (§ 1503.), and no cooking and warming apparatus for cottages has been produced that at all approaches the Bruges stove (§ 594.). Nevertheless, some good kitchen-ranges have been invented, the most

complete of which is one by Messrs. Steel of Edinburgh, adapted for first-rate houses, and described in the *Repertory of Arts*, vol. xiv. p. 159. There are also three different ranges of recent invention, each of which has a closed fireplace, and consequently not only cooks very economically, with great cleanliness and with much less trouble or excessive heat to the cook, but is an effectual cure for a smoky chimney. The most complete of these is Braithwaite's, price £13; and the most economical, Brown's of Luton, price between £6 and £7. We shall first give a description of Mr Strutt's oven, next of an improved Bruges stove, and lastly of one of the closed kitchen-ranges.

2530. *The Roasting-Oven* which has been in use in the kitchen of Joseph Strutt, Esq., of Derby, for upwards of thirty years, is represented by two sections and a plan, figs. 2299. to 2301. The front section, fig. 2299., shows the interior of the oven (the door

2299



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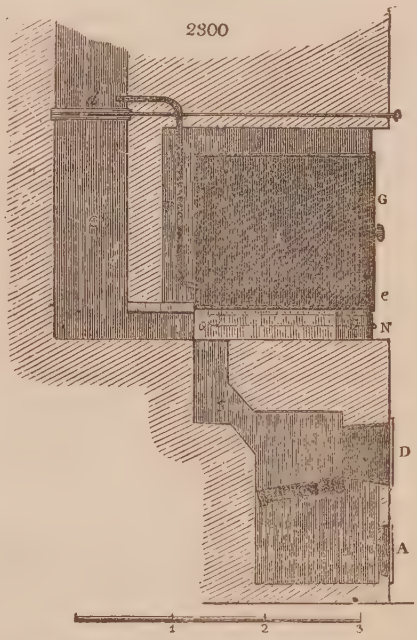
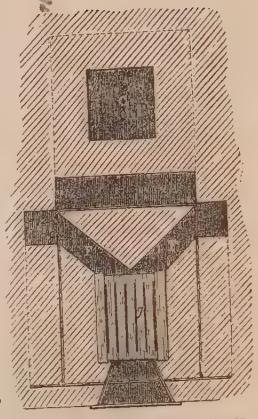


being removed), and also the cavity surrounding the oven. The oven rests upon bricks placed edgewise along each side, which forms a cavity under the oven, similar to that seen on the top and its other sides in the above figure. An opening into this cavity is seen at E, in the side section, fig. 2300. The fire, which is introduced at D, it will be seen, does not immediately act upon the oven: the flame branches on each side along the flues FF in fig. 2301., and then ascends perpendicularly, enveloping the back, the two sides, and the top of the oven; it is not, however, allowed to escape till it descends to E in fig. 2300., there being a similar hole on the other side. It is now compelled to pass under the oven, and thence into the chimney C, so that the bottom of the oven, which is generally the hottest part in other ovens, is the coldest in this; since the hot vapour does not reach it until it has given the greatest part of its heat to the top and sides.

In the front section, fig. 2299., is an opening, *o*, which indicates the mouth of a tube fastened into an iron plate, which is seen to close the front of the under cavity. This tube proceeds in a straight direction under the bottom of the oven, the whole length; it then turns with a curve, and comes back on the opposite side, where it terminates in the bottom of the oven, which communicates with the cavity, as seen in the side section, at *c*. This cavity is formed of sheet iron, similar to that of which the rest of the roaster is formed, and screwed to the door G. Towards the top of this cavity in the door is an aperture, *h*, opening into the oven. The tube F communicates with the oven and the chimney above the damper *d*. Now it will be evident that, when the door of the roaster is shut, a current of cold air will enter at *o* in the front section, and will become heated in passing along the curved tube under the oven; it will then enter the cavity *e* in the door G, and pass out at the hole *h* into the roaster, and thence

through the pipe F into the chimney, to the draught of which it owes its motion.

2301



This contrivance has two great advantages: its heat is sufficient to have a great effect upon the substances to be baked or roasted, and the constant change of the air contributes to the crusty brown so generally liked. Its greatest advantage, however, consists in carrying off the disagreeable smell complained of when meat is roasted in a common oven.

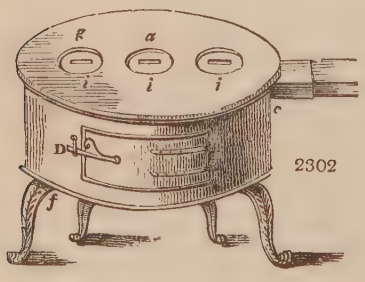
A is a register-door, opening into the ash-pit; D, the door for the fuel: beyond this is a second door, which opens by a hook attached to the first door.

Opposite to the cavity on each side and the cavity under the roaster are three small doors, *n*, *n*, *n*, which are opened occasionally for raking out the soot and ashes. This last operation is not required very often. The top and sides, which will soon become clogged with soot, are raked very frequently by another contrivance, which we can better describe than represent in the drawing. In the front section, fig. 2299., suppose the dark space, s, which surrounds the roaster to be a piece of sheet iron capable of being moved backward and forward, by means of a rod of iron fastened into the middle of that part which fits the cavity at the top of the roaster, and projecting to the front, like the rod of the damper, *d*, in the side section; then it will be evident that a rake of this form will, by its motion, completely scrape the top and sides of the roaster; an operation frequently necessary. This rake brings the soot to the bottom of the cavities; and when it is accumulated there to a certain extent, it requires to be withdrawn from the openings, *n n n*.

The above description was sent to us by Mr. Joseph Hunt, ironmonger, Derby, who put up Mr. Strutt's oven, and who informs us that one similar to that above described may be fitted up complete in Derby for £10 10*s*.

Mr. Strutt has two of these ovens in his kitchen; one similar to that described for common use, and another about twice the size for extraordinary occasions. Nothing has been roasted before an open fire in Mr. Strutt's kitchen for upwards of thirty years. To the excellence of Mr. Strutt's table all who have enjoyed that gentleman's hospitality will bear testimony.

2531. *The Bruges Stove*, as improved by Messrs. Cottam and Hallen, figs. 2302. to 2304., appears to be better adapted both for warming a common cottage and cooking at the same time, than any other either of British or foreign invention. The Flemings are a rigidly economical people, and therefore whatever is in use among them deserves serious consideration. This led us to figure and describe this stove in the Encyclopædia, p. 285., and we have now to present an improved form of it as exhibited in the figures referred to. It will, no doubt, be extremely difficult to get a British cottager, with all her prejudices for an open fire, to use this or any other cooking stove; nevertheless, we cordially agree with Mr. Cottam, that this stove will do more with a given quantity of fuel than any other stove or fireplace whatever. It has the means of stewing, boiling, broiling, roasting, and baking, at one and the same time, with a small quantity of coke or cinders from any other fire. It is simple in form, and there is not the slightest difficulty in its use. The holes in the top may be arranged as is found most convenient for the situation in which the stove is to be placed, either in a line, as in fig. 2300., or in the form of a triangle. One thing is indispensable for the proper action of this stove, and that is a good draught. It must therefore have a separate flue.



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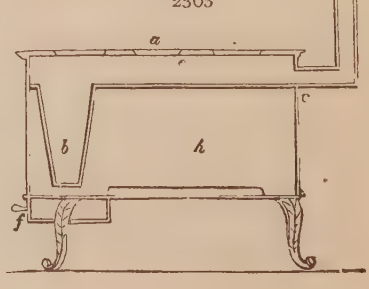
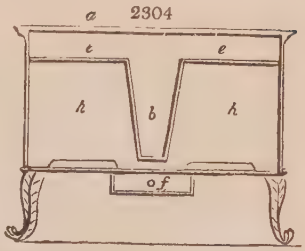
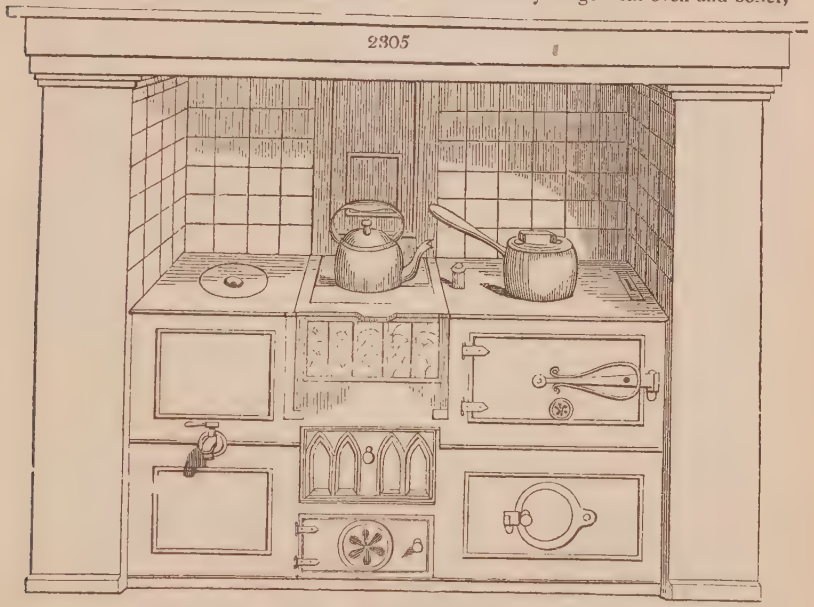




As it stands quite detached, heat is radiated from it on every side, and only that small portion is lost which goes up the chimney. In the figures, *a* is the top of the stove; *b* is the fire-pot; *g* is the lid of the hole for feeding the fire-pot; *f* is an ash drawer; *c* is the flue; *d* is the oven door; *h* is the oven; *e* is a space for the fire to pass to the flue, *c*, and for heating the whole of the top plate, any part of which will produce sufficient heat for culinary purposes; *i i i* have lids, which may be taken off, and the battery of stew-pans or boilers will then be in contact with the flame. A gridiron fits on any of these openings, which has the advantage of not smoking the article broiled, the draught being downwards. (*Arch. Mag.*, i. 77.) Unfortunately, the cost is between £6 and £7.

2532. *Brown of Luton's improved Kitchen-range*, fig. 2305., is founded on the principle of economising fuel. Its appearance is that of an ordinary range with oven and boiler,

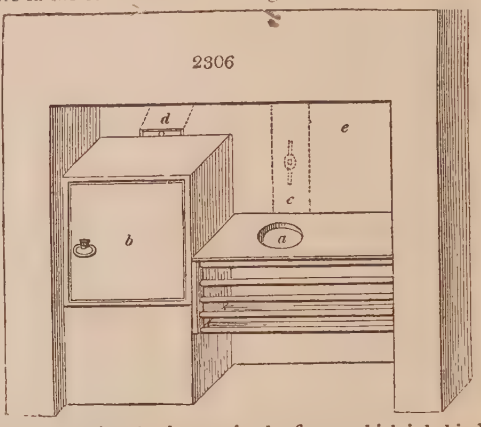


with the front and top of the fire-grate shut in, and the space beneath the bottom of the grate also partially enclosed. The fireplace is cased with fire-brick on the back and sides, and an iron plate forms the front, which, becoming red hot, supplies the heat necessary for roasting; when not in use for that purpose, it is screened by an outer plate sliding in groves on either side: a portion of the top plate is removable at pleasure, to afford an opportunity of boiling, frying, broiling, &c. The fire plays round the oven, and partly under the boiler, and the vapour escapes by a pipe into a chimney or other flue. The top forms a hot plate. The space under the grate-bottom in front is enclosed in part with talc, and the drawer for receiving the ashes occupies the remainder. There can be no doubt of the improvement effected in this range in the avoidance of smoke and dust, economy of fuel, &c., over the common range; the oven and boiler appear to act well in every respect; and the inventor states that he had roasted a leg of mutton by the red-hot plate of nineteen pounds and a half weight. This range is made in different sizes, and sold at from six to ten guineas each, at Luton, in Bedfordshire, and at 34. Gracechurch Street, London. Stoves very similar to that of Brown's are manufactured by Braithwaite, White Lion Court, Cornhill, at nearly double the price, by Wright of Arthur Street, London Bridge, by Nicholson at the Baker Street bazaar, and by E. Brown of Birmingham. They are all excellent in principle, cleanly, economical, and effectually cure a smoky chimney; and Mr. Brown's of Luton has the merit of being the cheapest.

2533. *Saul's improved Cottage Fireplace.* On the grate, fig. 2306., is placed a cast-

iron plate, with a circular aperture in the centre at *a*. It is eight inches and a half in diameter, which just takes a common tea-kettle, and answers well for other-sized pans, as it is of no moment if the pan is larger than the aperture. By this plan the heat is confined in the grate; and, by several experiments, it has been proved that any thing will much sooner boil in this closed grate than in an open one: and it also throws out a greater heat in the room, and prevents smoke; and, when the fire is not wanted for cooking, there is a plate to cover the aperture. It also consumes less fuel, and is a sure remedy for a smoky chimney. When an oven is also made in the same fireplace, as seen at *b*, the whole heat is made to pass under the oven by turning the damper in the flue *c*, which is behind the iron plate, when the smoke is carried up the oven flue, *d*. When the oven is not wanted, the flue *d* is closed with the damper, and then the smoke rises through the flue *c*. A small aperture is made on the top of the iron plate at *e*, to admit any smoke that may arise when putting on the fuel, or changing the kettles or pans. This plan may be adapted to any grate now in use. It is only necessary to get a cast-iron plate the size of the grate. It is to rest upon the top bar of the grate, and on the brickwork on the back; and a small aperture is to be made for the smoke to escape, and an iron plate fixed in front, to prevent the smoke from entering the room. (*A. M.*, v. 226.)

2306

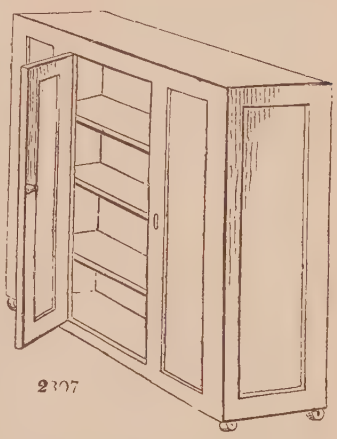


2534. *A portable Roaster*, formed of tin, is considered a most useful and economical apparatus for roasting meat before an open fire. The ordinary size of this roaster is about three feet long, two feet high, and one foot deep; but some are made nearly twice as large. The front which faces the fire is open, and the back and sides are of tinned iron. The spit is let into notches in the ends, and is turned by a small wind-up jack. The American oven is formed of tinned iron, and when used is set before the fire, the heat of which it receives directly in front, and by reflection from the inside of the bottom and top, which slope, the one upwards and the other downwards, at an angle of about 40°. The editor of the *British Farmer's Magazine*, speaking of this oven says, "it is one of the most valuable inventions of the kind we know, and ought to be in every farmhouse and every cottage in the kingdom. Our own family bread is chiefly baked in one of these ovens placed before the fire, and better bread there cannot be from any oven whatever. For roasting (not baking) small joints, we know nothing equal to it." (*Brit. Farm. Mag.*, new series, vol. vi. p. 98.) Another very economical oven is thus formed. A circular bottom of sheet iron, eleven inches in diameter, has a rim raised round it one inch and a half deep. To this bottom there is a cover four inches and a half, or at most five inches deep, which fits easy within the rim of the bottom. This forms the oven; and it only requires a handle by which to suspend it over the fire, which handle must be sufficiently high to allow of taking off and putting on the cover without inconvenience. There is a movable small hoop of sheet iron, about five inches in diameter and three inches and a quarter deep, to put the dish upon, and keep it from the bottom to prevent burning. The cost is about 3*s.*, and it bakes meat or bread well. A figure of this oven is given in *Mech. Mag.*, vol. xxxiii. p. 569. To these kitchen apparatus we must be excused for adding Platow's automaton coffee-pot, which is universally allowed to be by far the best utensil for making coffee that has hitherto been invented, price from 4*s.* upwards.

2535. *An economical Hot Closet* may be formed at very little expense, by taking a common hastener for placing before a kitchen fire when meat is roasting, and closing up the front, or side next the fire, with black sheet iron, forming a door at the back for putting in and taking out the articles to be kept hot. Black iron absorbs the heat powerfully; and the heated air within not being allowed to escape, becomes very hot. When it is desired to use this hot closet as a hastener in roasting meat, it is only necessary to hang in front, before the black iron, a covering of tinned sheet iron, which may be in two or more plates, according to the size of the hastener, for convenience of lifting on and off. Fig. 2307. is a back view of such a movable hot closet, with the door open, showing the shelves, &c. It is scarcely necessary to observe that white sheet iron will, in many cases, be preferable to black iron; because, while it

reflects the heat and hastens the meat, it will conduct and radiate quite enough into the hot closet; and what is collected there will not be so easily radiated through the tin as through the black sheet iron.

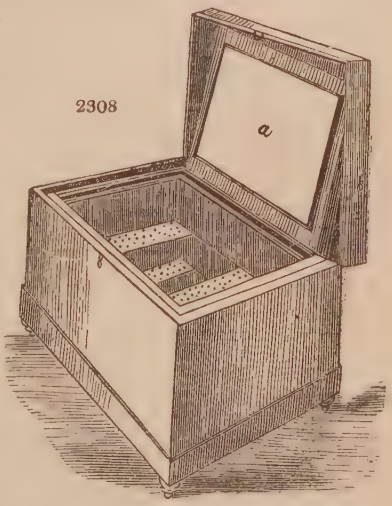
2536. *An improved Ironing Stove*, in which the fire is enclosed in brickwork, and consequently the fuel is more completely consumed, and the heat longer retained, than in the common stoves of this kind, which are wholly of cast iron, is strongly recommended, both in point of economy of fuel and avoidance of smoke.



2307

2537. *Clarke's Blower, as a Substitute for Bellows.* Clarke's blower is a tin tube, about eighteen inches long, tapering about one inch and a half in diameter, at an average. At one end is a circular box, containing a wheel with four fans, which is turned by means of two multiplying wheels, with a catgut rigger, these being set in motion by a winch. The velocity of the revolution of the fans draws in the air, and forces it through the mouth of the tube. The price varies from 4*s.* 6*d.* to 15*s.* (*A. M.*, 1. 87.)

2538. *Fuller's Ice-Box.* This may be described as one box within another, the inner box being six inches apart from the outer box on every side, and at the top and bottom. The space between the outer box and the inner box is filled up with burnt cork in a state of powder, as being a better nonconductor of heat than powdered charcoal of common wood. The lid is double like the sides, and the vacuity filled with charcoal in the same manner, to prevent the possibility of air getting in to the contents of the box when it is shut. The lid has ledges which project downwards into a gutter containing water, so as to render the junction airtight. The ice is contained in the well or space thus enclosed and protected, which is lined with cork; and which will keep the rough ice for three, four, or five weeks, in the hottest weather of summer. The usual size is three feet five inches by two feet eight inches, and three feet five inches in depth, outside measure; and the well, or inner box, will contain three hundred pounds of rough ice. The cost of a box of this size complete is £25 4*s.* The cost of the ice which is required to fill it, and which is supplied by a large wholesale dealer in that article at Southgate, Mr. Symonds, is about 15*s.*; the price per cwt. varying from 4*s.* to 6*s.*, of three sorts, sweepings, mixed, and pure, at different prices. The box three times filled will serve an ordinary family for a whole season. The box is the invention of Mr. Fuller, No. 60. Jermyn Street.

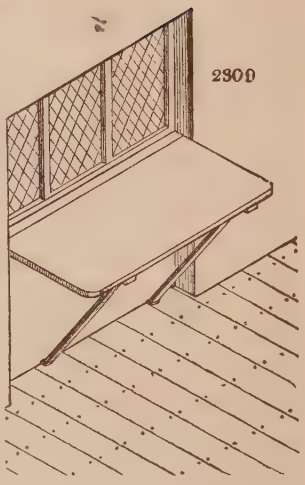


2308

2539. *The Refrigerator, or American Portable Icehouse.* Fig. 2308. exhibits the refrigerator with the lids raised, and showing the interior, with its sliding and perforated shelves (under which the ice is placed) for cooling and preserving wines, fruits, and provisions, without permitting them to come in contact one with another. The letters *a* and *b* represent two lids, with which the box is furnished to render it perfectly airtight: *a*, which is the inner lid, is formed of cork, and it is so constructed as to fit as tightly as possible in the inner box; *b* is the lid of the outer box, and the space between the two boxes is also filled with cork. The box, when filled with a few pounds of Wenham Lake ice, will preserve it for a fortnight. The boxes are made of two sizes, the smallest of which costs £4 10*s.*, and the larger one £6. It may be observed that the Wenham Lake ice is remarkably clear and firm, and from its being brought to this country in large blocks of immense thickness, it remains un-

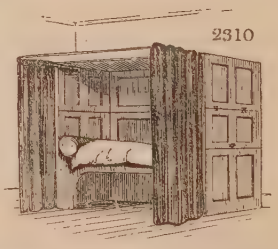
melted much longer than the thin ice usually preserved in icehouses in this country.

2540. *A temporary Table.* It is a matter of some difficulty, in small cottages, to place the shutters to the windows on the ground floor in such a manner as to answer the purpose, and yet be out of the way. The following plan has been adopted in some buildings of that description which have been lately erected. The shutters in fig. 2309. are hung on hinges in such a manner as to fall down into a recess below the window during the day time; and, consequently, they are quite out of the way when not wanted for shutting up the house, or for temporary purposes. The idea suggested itself, that shutters might be occasionally used as a table; and, to effect this end, two movable bars, as supports, were let into mortises in the floor, and made to abut against similar mortises made in the ledges on the under side of the shutters. The two cornices were slightly rounded, and the upper surface was left plain without paint. Two swing iron or wooden brackets might be used, instead of the two wooden bars, as they could be folded back into the recess also. (*Arch. Mag.*, v. 75.)

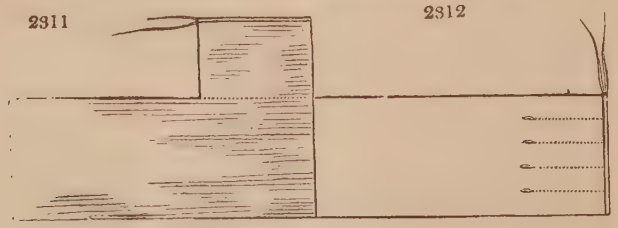

2309

Sect. IV. *Bed-room Furniture.*

2541. *An Improvement in the Box Bedsteads used in Scotch Cottages*, made by Dr. Wilson of Kelso, is shown in fig. 2310. It consists of a curtain-rod and curtains, which may be drawn out about three feet from the front of the bed, so as to form sufficient space between the curtain and the bed to serve as a dressing-room. Some of the Leith and London steamers had the berths in the ladies' cabins fitted up in this way some years ago. Another improvement, introduced by Dr. Wilson, in these beds, consists of the hinging of a part of the roof of the bed so that it may be opened like a trap-door, at pleasure, for ventilation; and the hinging of boards at the foot and at the back, for the same object, and for giving access to a medical attendant. These improvements, we trust, form one step towards getting rid of box bedsteads altogether. They may be very desirable in the wretched hovels in which they are generally found, but in comfortable cottages they are neither favourable to health nor to habits of cleanliness.


2310

2542. *A travelling Bed*, fig. 2313, which was used by Charles Fellowes, Esq., during an excursion in Asia Minor, in 1838, and is described and illustrated by figures in his *Journal in Asia Minor, &c.*, p. 306, will be found a valuable article of travelling furniture for being used in countries abounding with gnats and other insects. Mr. Fellowes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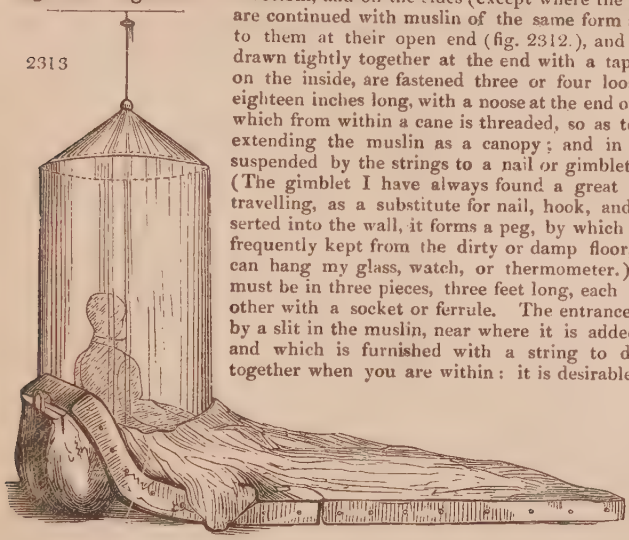
2312

has kindly permitted us to make the following extract from his work, and to copy the engravings. "For the plan of this bed I was indebted, many years ago, to my friend Mr. Godfrey Levinge, and have ever since by its use been rendered independent of all the insect world. The gnats, flies, beetles, &c., never agreeable even if harmless, are constantly attracted by the light of the candles or the warmth of the mattress; and this simple

contrivance I have found the only plan for preventing their intrusion. Thus insuring an undisturbed night, I have cared little for their attacks by day. The whole apparatus may be compressed into a hat-case. A pair of calico sheets (fig. 2311.), six feet long, sewed together at the bottom, and on the sides (except where the neck is added), are continued with muslin of the same form and size, sewed to them at their open end (fig. 2312.), and this muslin is drawn tightly together at the end with a tape; at this end, on the inside, are fastened three or four loose tapes, about eighteen inches long, with a noose at the end of each, through which from within a cane is threaded, so as to form a circle, extending the muslin as a canopy; and in this form it is suspended by the strings to a nail or gimblet in the ceiling. (The gimblet I have always found a great convenience in travelling, as a substitute for nail, hook, and hammer: inserted into the wall, it forms a peg, by which my clothes are frequently kept from the dirty or damp floor, or to which I can hang my glass, watch, or thermometer.) These canes must be in three pieces, three feet long, each fitting into the other with a socket or ferrule. The entrance to the bed is by a slit in the muslin, near where it is added to the calico, and which is furnished with a string to draw it tightly together when you are within: it is desirable that the traveller should enter this bed as he would a shower-bath, and having his night-shirt within. When the end, formed of muslin, is suspended, the bed forms an airy canopy, in which the occupant may stand up and dress in privacy, no one being able to see him from without, while he can observe all around. I have often, when annoyed by insects, sat to read and write within this shelter in the evening, with a candle placed near me. To prevent accident from tearing the apparatus, I have found that the best mode of entering was to keep the opening on the middle of the mattress, and standing in it, to draw the bag-entrance over my head. The figures will, I think, supply the place of any further description." (*Journal in Asia Minor*, &c., p. 306.)

2313



2543. *Concealed Washhand-stand.* In a room which serves both as a sitting-room and bed-room it may often be desirable to have a concealed wash-stand. The recess by the side of the chimney is often enclosed as a cupboard by a door in the usual manner: against the inside of this door may be screwed a common wash-stand, having its legs cut short enough to pass over the wash-board of the room without throwing the basin too high for comfortable use. When the door is shut the washing apparatus is in the cupboard, but when the door is open the means of washing are in the room in a most convenient situation. This contrivance, and a sofa bed, together, afford the economist the uses of a bed-room without the appearance of one. — *J. I. H.*

2544. *Towel-stands* may be fixed to the top of wash-stands in the same manner as rails are often affixed to side-boards. They would occupy no additional space, and would protect the wall or paper from splashings. Towel stands frequently occupy more room than can be spared, but brackets (fig. 2314.), which may be of iron or wood, may be screwed to the washhand-stand, with a bar, either round or polygonal, fixed between them. This would be ornamental rather than otherwise to the stand, and it would not be inconvenient to place the towel upon: if two sets could be fixed, they would have the appearance of handles, where an angular stand was used; and if it should be more convenient, these brackets might be affixed to the side of a chest of drawers, or against any part of the wall. (*Arch. Mag.*, vol. i. p. 391.)

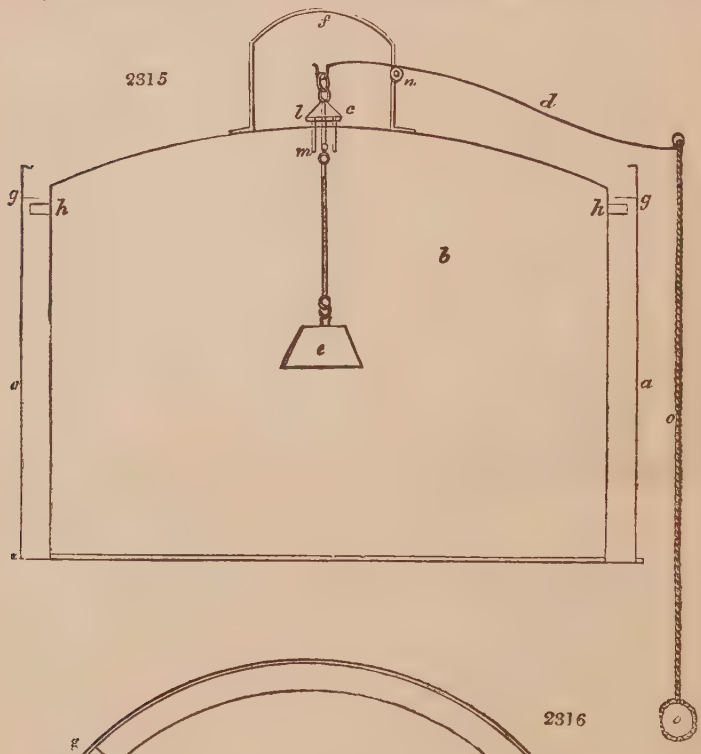
2314

2545. *An oval Hip-bath*, made of tin or copper. The depth of this bath, inside measure, is twelve inches: the base on which it stands is three inches; the length of the bath is thirteen inches and a half at the top, and nineteen inches at the bottom; its breadth, twenty inches at the top, and twelve inches and a half at the bottom; the shoulder-piece is eight inches deep. This bath may be used as a child's bath, hip-bath, foot-bath, spunging-bath, or even as a washing-tub. A circular piece of oil-cloth, at least three times the diameter of the bath, having the edges turned up over a piece of

rope, so as to form a water-tight rim, receives any splashings from the bath, and saves the carpet or the floor. When not wanted, this oil-cloth saucer goes into very little bulk.

2546. *A cheap portable Shower-bath* has been manufactured by Milne and Son, Edinburgh. Fig. 2315. is a section of the bath, with its cistern, or outer case; and

2315



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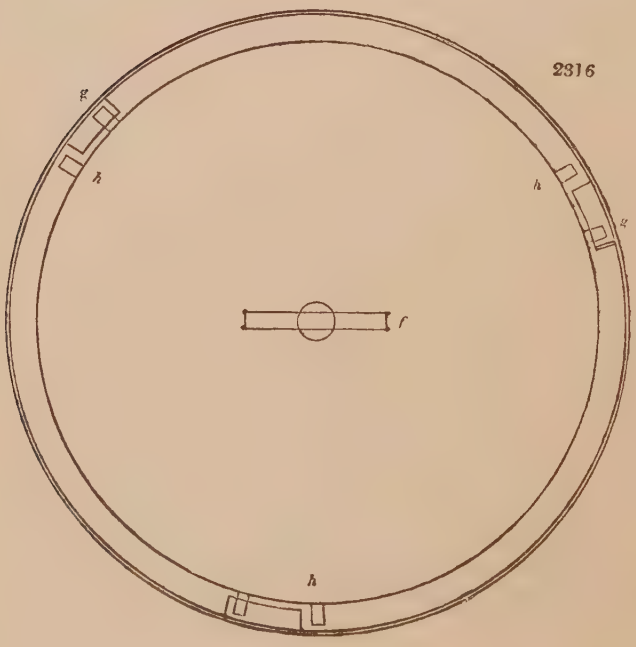
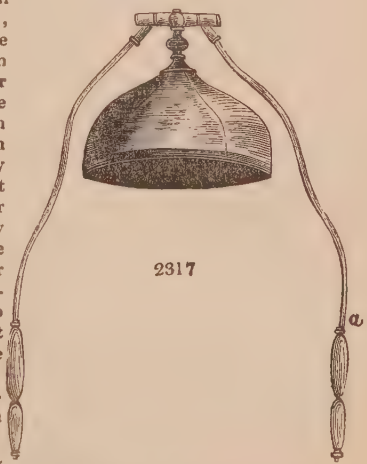
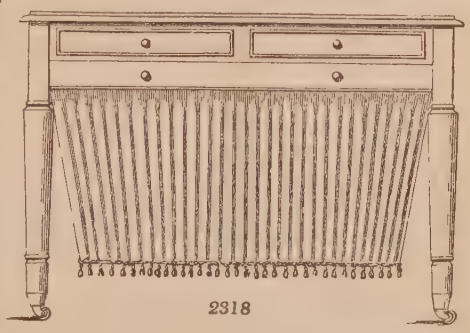


fig. 2316. is a top view, showing the manner in which it is connected with its case, so as to be carried from one place to another; *a* is the cistern, or outer case, made about 1 in. larger in diameter, and 1 in. deeper than *b*; *b* is the vessel to contain the water to produce the shower, having a bottom perforated with fine holes, about $\frac{1}{30}$ of an inch in diameter, the top a little raised having in the centre a tube (*m*) soldered into it; *c* is an airtight valve, with a leather face (*l*), which the lead weight *e* pulls close, so as to exclude the pressure of the atmosphere; *f* is a bow or handle, to carry or hang the bath by, having a slit at *n* to allow the wire lever *d* to pass through. The lever (*d*) is connected with the valve (*c*) by a hook, and has its fulcrum at *n*, on a wire pin soldered across the slit in *f*. By pulling the string *o*, and raising the valve, the pressure of the atmosphere is admitted to the surface of the water in *b*, allowing the water to escape in a shower from the bottom. The moment the string is let go, the water ceases to run. The shower may be continued as long as there is water in the vessel, by continuing hold of the string. *h h h* are three pins soldered to the vessel *b*, near the top, which pins slip under three plates, kneed down at one end to stop the pins, and soldered to the inside of the vessel *a*. When the pins are turned to the left, to the position of the dotted lines, the outer case is lifted along with the vessel *b*. To use the bath, fill the outer case with water, either cold or tepid, till within one inch of the top, then sink the bath into the water, pressing it down gently, keeping the valve open all the time, to allow the air to escape, till it reaches the bottom; then turn the bath a little round, as shown in fig. 2316., by the position of the pins, and carry it to the place where it is to be used, and hang it from the roof by a hook, or raise it by a cord over a pulley; then turn the outer case to the right, to free the pins, and remove it from the vessel; the water will remain in the bath till the air be admitted by the valve. By pulling the string you can have a shower at pleasure, short or long, while there is water in the vessel. The bath may be made of any size by any country tinsmith. A cock may be used instead of the valve, having a long lever attached to the key, with a balance at the opposite end to the string of sufficient weight to overcome the friction of the cock, and keep it always shut, except when kept open by the string. (*Arch. Mag.*, vol. v. p. 468.)



2317

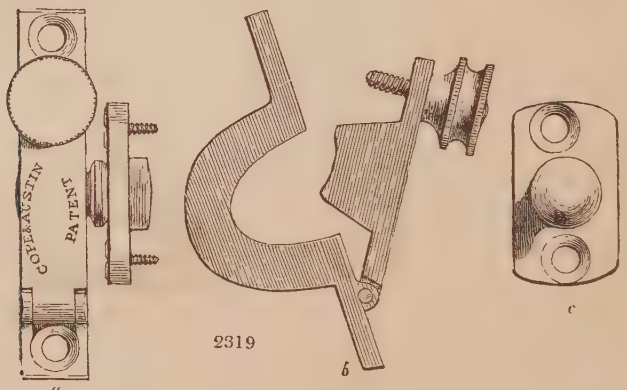
2547. *Hazard's portable pneumatic shower-bath.* This bath (fig. 2317.), though much smaller and more simple than that of Mr. Milne, acts on the same principle. When it is to be used it only requires to be immersed in sufficient water to cover it, and when filled, the patient must take hold of the handles and press the thumb of the right-hand on the aperture at *a*, so as to prevent any air from entering. The bath may then be raised and placed in the proper position, without any fear of the water running from it till the thumb is removed, and the air admitted through the tube, when the water will descend in a copious shower.


2318

2548. *A Dressing-table with a Bag Drawer*, fig. 2318., is a most useful piece of bed-room furniture. It is three feet seven inches long, two feet seven inches high, and two feet six inches wide. There are two upper drawers, and a frame resembling a drawer externally, of the length of the table beneath. To this frame a bag of fluted silk is attached, tapering downwards, and reaching within six inches of the floor, leaving just enough of space to allow room for the feet and knees when the lady is sitting before the table. The bag pulls out like a drawer, and has a wooden bottom, to which may be fixed

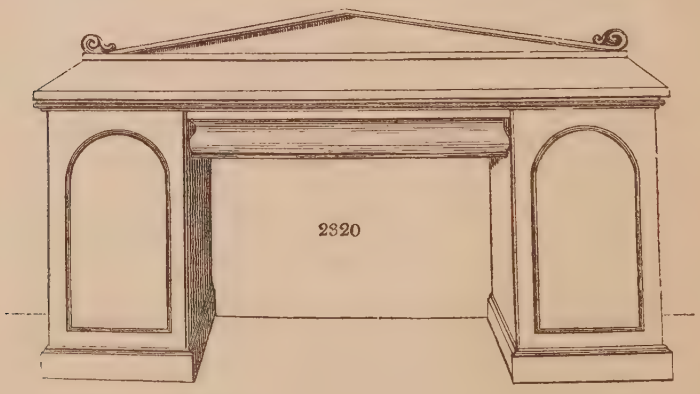
stands (fig. 587. in p. 304.) on which to place bonnets; and hooks may be attached to the inside of the wooden frame from which the silk bag hangs, on which to place caps. — *Selim.* (The author of the "Beau Ideal of an English Villa," in p. 790.) Every lady will see at once the saving of room that this kind of dressing-table is calculated to effect.

2549. *Swing Glass Fastening.* The object of this fastening, which is represented in fig. 2319., is to give the power of fixing the swing looking-glass in any one position. This is done by compressing a movable portion of the case in which the gudgeon works, by means of a screw. The contrivance will be very easily understood by fig. 2319.; in which *a* is a front view of the apparatus, the gudgeon being in its socket, and the plate and screws seen, by which this socket is fixed to the frame of the glass; *b* is a section showing the movable portion of the socket, and the screw which is used for compressing it; and *c* is the front view of part of *b*. This invention is known by the name of Cope and Austin's Swing-glass Fastening. (*Arch. Mag.*, vol. v. p. 605.)



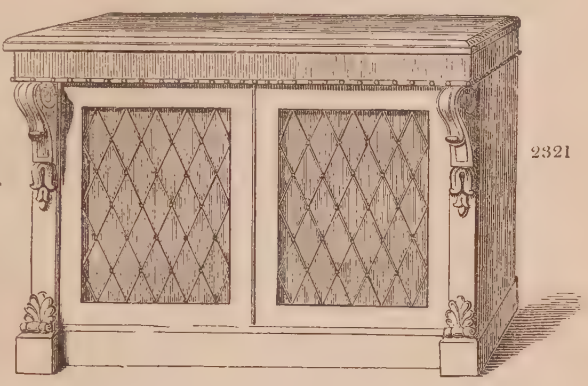
Sect. V. *Furniture for Living-Rooms*

2550. *A Sideboard*, fig. 2320., of common deal, painted so as to resemble oak, with the top of one plate of Penrhyn slate, which can be had in slabs ten or twelve feet long



and broad, and of any thickness, is strongly recommended. In setting down glasses on slabs of slate or marble, servants are apt to break them for some time at first, till they get accustomed to the difference between these materials and wood. Slate is expeditiously cut dry with a common hand-saw, and afterwards wrought with rasps and files, without the aid of water and sand, as in cutting stone and marble.

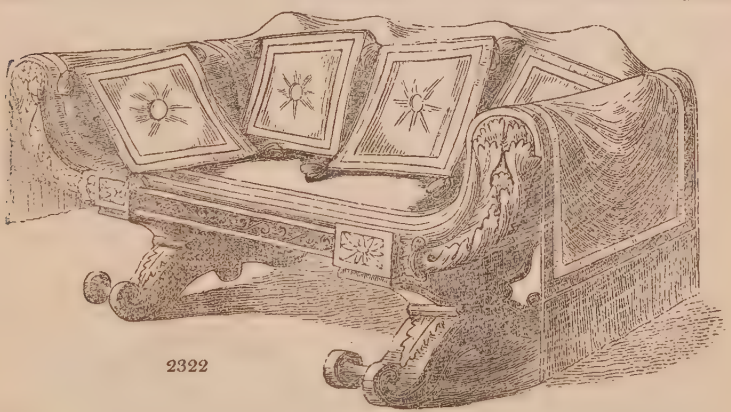
2551. *Leaves for a Dining-Table.* A side-board or side-table may contain the leaves of a dining-table immediately under the slab. They may slide horizontally into grooves, and be concealed and protected from dust by a flap, opening down like that of an escrutoire.



2321

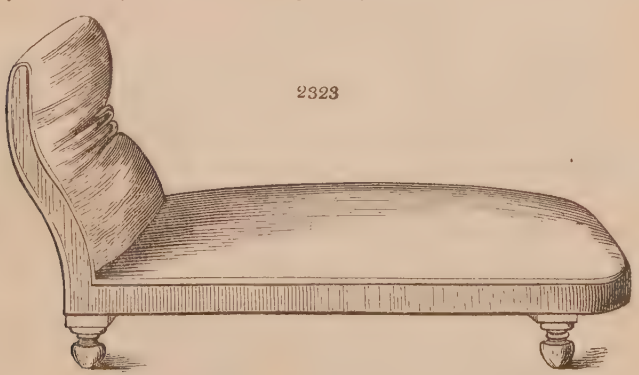
2552. *A handsome Architectural Chiffonier* is shown in fig. 2321.; the top may be a marble slab, and the panels of the doors filled in with green silk, protected by gilt wire.

2553. *A very elegant Sofa*, fig. 2322., has been invented by Mr. Lamb. As its merit depends entirely upon its form, it may be made of any materials which suit the general



2322

style of furniture in the room. The squabs are square, and movable at pleasure; the seat is stuffed below them; and the covering is carried on over the back and arms, hanging in loose drapery, and finished by a deep fringe. The legs are richly carved, and very massive. (*Arch. Mag.*, vol. v. p. 605.)



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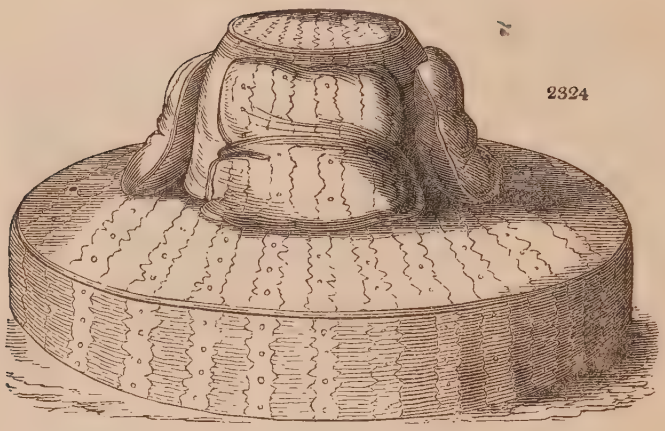
2554. *Drawing-room Seats.* Fig. 2323. is a reading-seat; fig. 2324. is a circular



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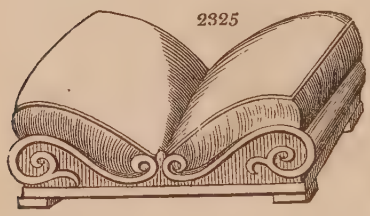
Ottoman sofa; and fig. 2328. an hour-glass seat. The last, besides its use in the drawingroom, may be made of straw, or, in some countries, of heath, and appropriately placed in the centre of a large rustic summer-house. The reading-seat, fig. 2323., is by no means elegant in form; but we can assert, from experience, that it is exceedingly comfortable to sit on; not only the back, but the head being supported by the peculiar form of the upper part of the end, or support for the back. A footstool is shown in fig. 2325.



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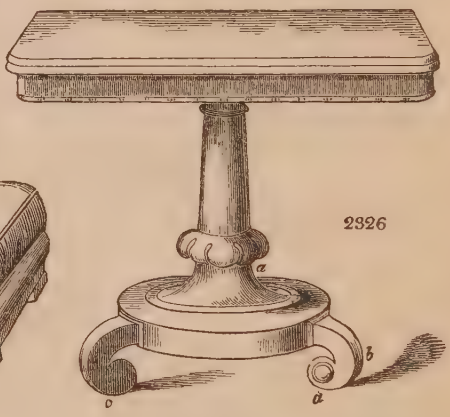

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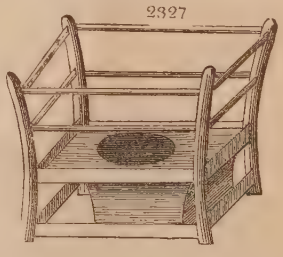
2555. *A Child's Chair*, fig. 2327., with a well in the middle of the seat, is a piece of useful cottage furniture, as a child may be put into it at seven months old. It is twenty inches square at the ground, twenty-three inches square at the top, and twenty inches high. Price, in common materials, 2*s.* 6*d.*



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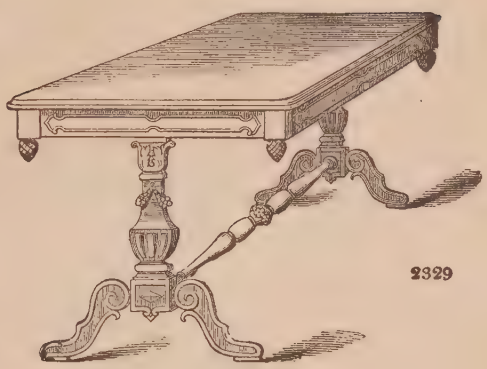
2556. *A Card-Table*, fig. 2326. The concave curve at *a*, as contrasted with the convex curve at *b*, has a good effect. The scroll foot, exhibited at *c*, is rather plain, and would be improved, as it appears to us, by some such addition as we have shown at *d*.

2557. *An occasional Table in the Elizabethan Style* is shown in fig. 2329. It is very handsome, and highly expressive of the most cultivated variety of that manner of architectural design.

2558. *Pays, or supported Tea-Chests*, are shown in figs. 2330. and 2331.; both handsome.

2559. *Work-Tables for Ladies* are shown in figs. 2332. and 2333., the latter in the style of Louis XIV.; very handsome.

2328



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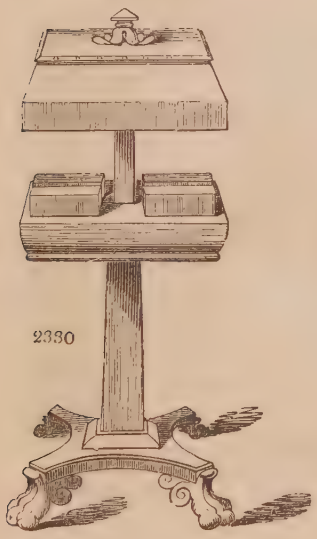

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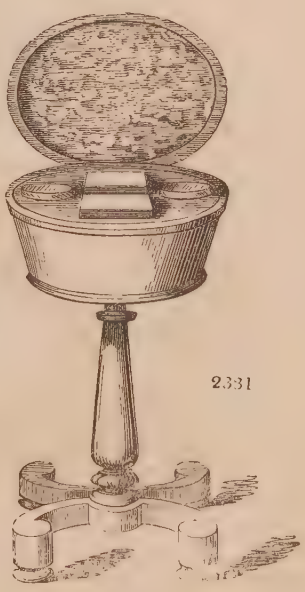

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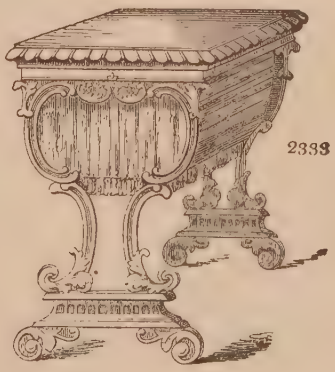
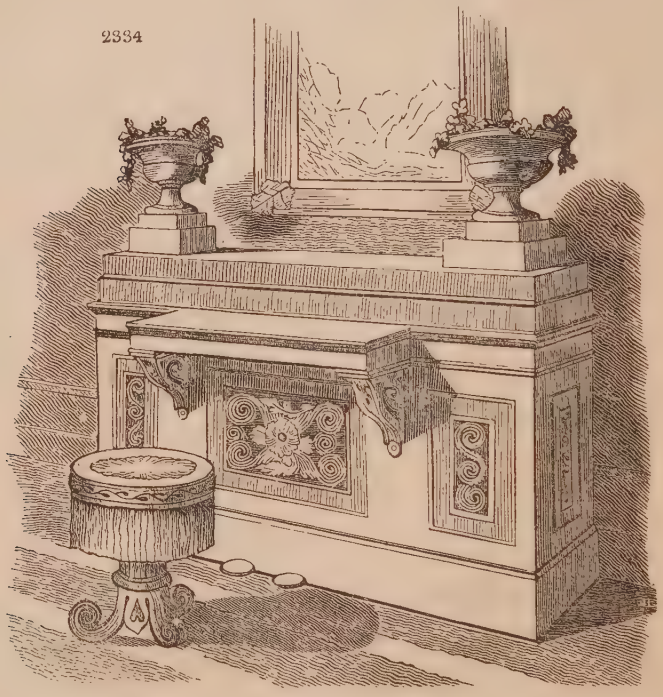


2333

2560. *Mr. Lamb's Piano*, fig 2334. In describing this piano, Mr. Lamb observes, "when recently sketching various designs for furniture, among the number the grand pianoforte presented the greatest difficulties to surmount: the form prescribed by its uses, the great space required for it in a room, and the very unarchitectural character it assumed, set me to consider whether some alterations could not be made, so as to embrace all the utility of the present instrument with more beauty; and for this end the sketch, fig. 2334., was produced, which I send merely as a hint to manufacturers, at the same time stating my objections to the instruments now in use: it will be for others to object to mine. The horizontal grand pianoforte, which is the most perfect instrument now in use, is of such an awkward shape, that it is almost impossible to give

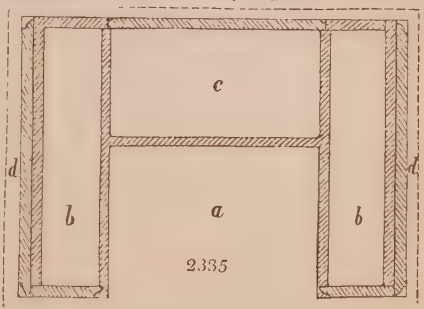
2334

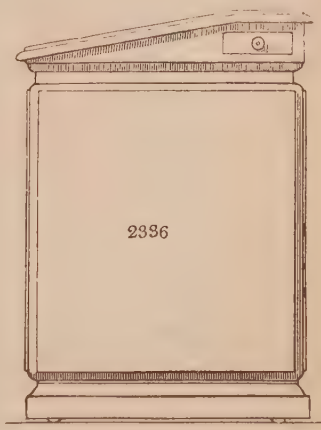


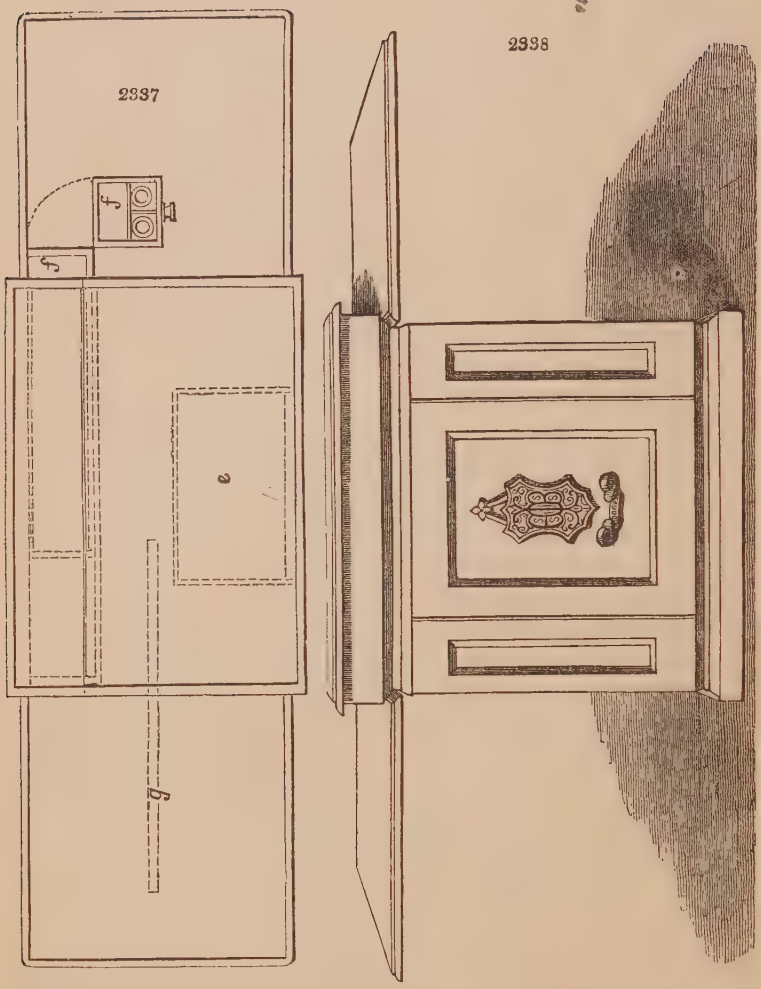
any expression of style to it; and, in a moderate-sized house, it occupies so large a portion of the room in which it is placed, that now the upright grand pianoforte is generally substituted for it. This is a more recent invention, and certainly is more compact in form; but, although much might have been done in the way of characteristic decoration, it is seldom distinguished by any marks of judgment or good taste. The upholsterer (if he makes the design) gives it columns so shrunk in the shafts, that they may frequently be seen twenty or thirty diameters high: the capitals and bases are equally inconsistent; and the cornice is a crowning absurdity of massive ovolo and turned beads. But, if no attempts at strict architecture had been made, the form would, perhaps, by its simplicity, have been more in character with the architecture of the room. To produce architectural fitness of expression, it is not necessary to employ columns; and where they are introduced so small, and in such situations, they rather create a disgust, than the pleasurable sensations they inspire when viewed as the necessary adjuncts of a portico. The objection to an upright grand pianoforte is, in my opinion, great; for, when the player is also 'obliging us with a song,' at least half the delight we should feel from those 'dulcet sounds' is lost in the silk which faces the singer. As this is known and acknowledged to be a defect by all makers, I am surprised that no remedy for the evil has been attempted by keeping the whole body of the instrument below the head of the performer, which a very little contrivance might effect. Cabinet, cottage, and other small pianofortes, are sufficiently below the voice generally for all the purposes of a singer; but they do not possess the power and

variety of the grand piano. In the sketch fig. 2334. I have endeavoured to obviate all the difficulties above mentioned: that it can be constructed I have no doubt, and that, too, with very little alteration in the present mechanism; this alteration being principally in the keys and hammers. But I may just mention one obstacle, which is independent of the instrument; viz. the great difficulty of getting makers out of the beaten track. This design resembles a grand, or rather a large square, pianoforte, turned on its edge, and the keys projecting at right angles from it: the whole body of the instrument is thus kept below the performer, which renders it equal to the horizontal grand piano; while it occupies much less space than the latter instrument, and it is superior as an article of furniture. As all the sides could be finished alike, it can be placed in almost any situation, so that the performer can face the company, and thus the full effect of the voice be heard; and, if surmounted with vases of glass or alabaster, bronze figures, candelabra, or other ornaments, it would form an agreeable acquisition to the drawingroom. It may be constructed in the most simple manner, or it can be richly decorated." (*Arch. Mag.*, vol. v. p. 29.)

2561. *Bookcases and Desks.* Mr. Lamb has invented a very ingenious architect's desk, and the following is his description of it. "I have recently had a new desk made; and, as it comprises some things which, perhaps, are novel, I send you five sketches of it (figs. 2335. to 2339.), together with some of the reasons which led me to adopt this design; though, as a production of my own, I may show a greater degree of partiality for it than it merits. I found that the most convenient drawing-table or desk for my own use was one that would take little room, and, at the same time, could be extended at pleasure, so as to give me an opportunity of having a number of drawings or books of reference always within my reach; and, that I might not be frozen in inclement weather, by being obliged to be seated at a fixed desk, or, at least, one that could be moved only with difficulty, the one I required should move with the greatest facility; so that, in whatever situation I might choose to place myself in my study, little more than the mere will was necessary to obtain it. A flat table I considered objectionable to draw upon, for obvious reasons; and a moveable support for a drawing-board I have always found to be inconvenient; therefore an inclined desk was determined upon, as, on removing the drawing-board, a writing-desk is obtained. The means of extending the top by flaps (figs. 2337. and 2338.) is the most simple and expeditious I could devise. I found it desirable to keep the centre part higher than the sides, in order that, when the centre is occupied by a drawing-board, which may extend somewhat over the flaps, they being lower, drawing-boards may be placed upon them when necessary, without being in the way of the free use of the T square on the centre board; or books and papers may be laid here open, without the liability of their being injured or pushed off by any movement required by the centre board. In fig. 2335. will be seen the general plan of the lower part; in which *a* is the space for the knees in front, 18 in. wide, 13 in. deep, and 25 in. high to the drawer rail: *b b* are side closets, with one shelf in each; the dotted curve lines show the way these closets open: *c* is a closet at the back, with one shelf for books, papers, &c.; the closets in front being used for rolled up drawings, and other papers in present use: *d d*, the side-flaps, when down. It will be seen from this plan that the mouldings at the angles are all of the same form, and return round the sides; thus making a border to the flaps the same as the one to the desk in the centre. The sections of these mouldings are necessarily quadrants of circles, or what workmen call quarter rounds. By the perspective sketch (fig. 2339.) the effect of this arrangement will be seen. Fig. 2337. is the plan of the







top, with both flaps up; the whole extent of which, when thus opened, is 6 ft. 9 in.; the top of the desk alone is 2 ft. 11 in. wide, and the depth 2 ft. 1 in.; the flaps are 2 ft. 1 in. by 1 ft. 11 in. The dotted lines at *e* in this figure show a small drawer, over the recess for the knees; *f* is a long drawer for pens, pencils, wax, &c. This drawer is divided in the manner shown on the sketch; and one part, which turns nearer the hand, is supplied with ink-stands; the dotted lines in the upper part show the situation this drawer occupies; and the dotted lines at *g* show the situation of the bearers of the flaps, which bearers draw out from under the desk. Fig. 2336. is an elevation of one of the sides. The back, with the flaps up, is shown in *fig.* 2338. *Fig.* 2339. is a perspective sketch, showing the appearance when the flaps are down. The drawer, the front closets, and the desk, are, by a very simple contrivance, fastened at the same time; and only one lock is required to be used. The closet at the back has a separate lock; but the same means of securing this at once could be applied, if it should be required. This design might be useful for a small library, the centre top being horizontal; or as an office or a counting-house desk I think it would be found convenient. It would then, perhaps, be necessary to cover the centre top with leather, in the usual way of office tables; but, for an architect's desk, a leather top would be liable to be scratched and defaced by drawing-boards. It might display a great deal of ornament, or be cou-

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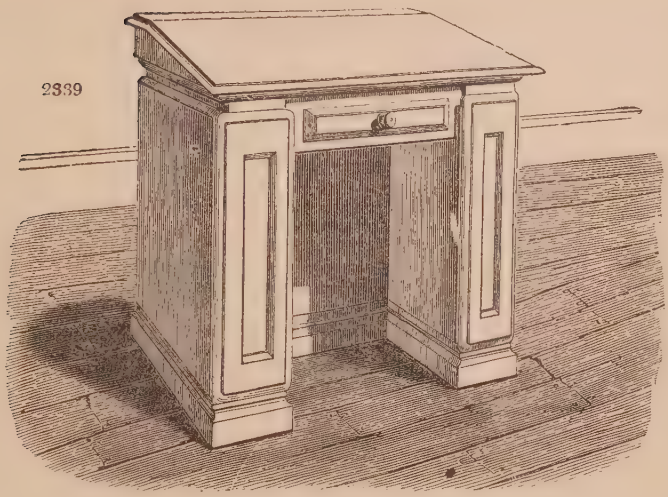
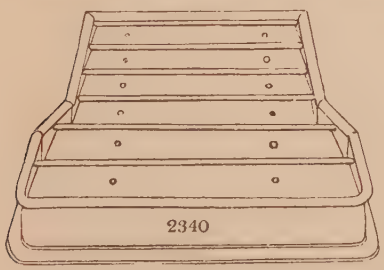


structed with ornamental woods. The one I have had made is of wainscot; my object being to obtain convenience combined with neatness and simplicity." (*Arch. Mag.*, vol. v. p. 265.) In the *Architectural Magazine* several other desks, and some bookcases, are figured and described; and T. Sopwith, Esq., of Newcastle, has invented a Monocleid Writing-Cabinet, which is adapted to save much time, and to secure a systematic arrangement of a great number and variety of papers. Mr. Sopwith has described this piece of furniture in a pamphlet, and it is manufactured for sale by Mr. John Sopwith, of Grey Street, in Newcastle.

2562. *German Silver.* Keys, shields to locks, finger plates, and various ornaments, especially in the Gothic or Louis XIV. styles, may be made in this metal, much cheaper and handsomer than in steel or brass.

2563. *An Ash-Pan with Venetian Blinds*, figs. 2340. to 2342., is in general use in Birmingham, and in districts in that neighbourhood, where the coals produce a large



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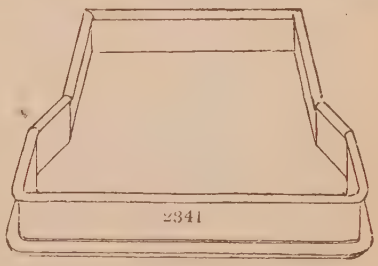

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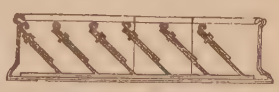
proportion of ashes. The object of the blinds is to prevent the ashes from being seen when lying in the pans. The blinds for sitting-rooms are of polished iron, or of tinned iron, perfectly smooth, so that no ashes may adhere to them, and they are set at an angle of 52°, as shown in the section, fig. 2342. For kitchens and common cottages the blinds are black. When the pan is to be emptied, all that is necessary is to lift out the blinds. Fig. 2340. shows the pan with the blinds complete; fig. 2341., the pan with the blinds taken out; and fig. 2342., a section of the blinds. The common price is from 8*s.* to 10*s.* There are ash-pans made in Birmingham, with the bottoms sloping backwards, so as to throw the ashes as much as possible back, and out of sight; and sometimes the hearth is so formed. A metallic hearth, somewhat in imitation of Sylvester's open fireplace (§ 2062.), has recently been invented by Methley, of Frith Street, Soho.

2342



In the *Architectural Magazine* a great many other handsome pieces of furniture, including sideboards, dinner waggons. desks, bookcases, ladies' work-tables, &c., will be found figured and described.

Chap. VII.

Hints to Proprietors desirous of improving the Labourers' Cottages on their Estates.

2564. *On estates of moderate extent,* where the proprietor looks into every thing himself, much may be done by his personally examining, along with his carpenter, the *Labourers' Cottages* already existing, and ascertaining their present state with reference to the list of essential requisites in p. 1130. This being done, the next step is to devise improvements: — by draining; by additions of garden ground; by putting the garden and the cottage, if practicable, in a ring fence; and by such alterations and additions to the cottage as may appear necessary for health and comfort. To assist in this manner of improvement the following particulars may be found useful.

2565. *Situation.* It ought to be constantly borne in mind, that the main object in building a cottage is to produce a comfortable dwelling; and that for this purpose a dry airy situation, in which, if possible, the ground falls gently from the cottage on every side; an aspect that will allow the sun to shine on every side wall of the cottage a portion of every day in the year; thick walls, and thick or double far-projecting roofs of high pitch; are most desirable requisites. Whether the front, the end, or one side of the cottage is parallel to the adjoining road, ought to be considered a matter of no consequence; indeed, so far from a parallel position being desirable, an oblique one is in general preferable, as we have shown § 2237.

2566. *Garden.* The garden ought always, if possible, to surround the cottage, and it ought never to be less in extent than a sixth of an acre; but as in cottages already existing it may often be found impracticable to surround the cottage with its garden, the next best arrangements are, to have the garden before, or behind, or on one side; or partly before and behind and partly on one side. If the main body of the garden must of necessity be separated from the cottage, then there should be a direct communication with it by a path, so as to diminish as much as possible the inconvenience and discomfort of an isolated garden. Cottage allotments, by which are to be understood portions of ground in a field allotted to cottages at some distance, are much better than no gardens at all; but they are far from producing the comfort and enjoyment of a garden in close contact with the cottage to which it belongs.

2567. *Materials.* When the walls are of pisé, mud, cob, clay lumps, or any other description of consolidated earth, the thickness of two feet may be obtained in solid materials; and this may also be the case where stone is abundant: but where brick must, of necessity, be used, the thickness of eighteen inches or two feet is to be attained most economically by building the walls with brick on edge hollow, and filling them up with concrete. By this means we form a mass of solid material, which will, of course, have a greater capacity for heat than a hollow wall, and consequently give out more when it is wanted for heating the air of the rooms. The advantages of thick walls, and of thick or double roofs, of high pitch, and projecting at the eaves, with reference to retaining heat, are greater than can well be conceived by those who have not dwelt in a cottage. A high and dry floor is essential, whether this be obtained by placing the cottage on a terrace, as in the model cottage No. I. in p. 1131.; or by raising the floor inside, and ascending to it by outside steps, as in the mechanic's model cottage in p. 1135.

2568. *Designing Cottages.* In page 1130. we have summed up the essential requisites for a labourer's cottage, with a view to convenience, comfort, and other directly useful properties. The following Rules are to be considered as additional to those given in the page referred to, and as having for their object to superadd to comfort and convenience the beauties of Architectural Design and Taste.

1. Every exterior wall should show a plinth at its base, and a frieze or wall-plate immediately under the roof. In the case of earthen walls, the plinth should be of brick or stone, and the wall-plate of wood. The stones of the plinth should be larger than those used in the plain parts of the wall which are above it; and the upper finishing of the plinth may be the outer edge of a course of slates, flagstones, tiles, or bricks, laid in cement, extending through the entire thickness of the wall, in order to prevent the rising of damp; the appearance of the edge of this course as a moulding or string course crowning the plinth, will, therefore, be highly expressive of

utility: or the entire plinth may be built in cement, which will be equally effective in preventing the rising of damp, as well as expressive of that important use.

2. The pitch of the roof, whatever may be the material with which it is covered, should be such as to prevent snow from lying on it; and for this purpose the cross section should generally be an equilateral triangle. Cottages which form gate-lodges in the Grecian or Italian styles form exceptions to this rule; but such lodges never express the same ideas of comfort as high-roofed cottages, with high and bold chimneys. Such lodges, indeed, are commonly called "boxes;" and in fact many of them are so deficient in height, and in every other dimension, that they give rise to ideas the very opposite of those of freedom and comfort.

3. When the wall of a house is built of rubble-work, small stones, or bricks, the sharp right angles formed at the sides of the doors and windows, and at the corners of the building are liable to be injured by accident or the weather; so that first the mortar of the joints, and afterwards the stones or bricks, drop out. To guard against this evil, or the idea of it, larger stones are used in building jambs and corners, or the jambs are splayed or rounded off; while the lintels and sills of the doors and windows are formed of single stones. Hence all doors and windows in such walls should be surrounded by casings of some sort; or have the jambs, sills, or lintels, splayed. Hence, also, the propriety of quoin-stones at the angles or corners, of coping-stones to the gables, of cut and dressed stones to the chimney-tops, and of larger stones to the plinths than those generally used in the plain parts of the wall above them. In the case of earthen walls, the jambs, sills, and lintels may be of timber, or formed of brick carried up from the plinth.

4. Every stack of chimneys should consist of four parts: a plinth, which should be distinctly seen above the roof; one or more base mouldings, or splayed weatherings resting on the plinth; a shaft rising from the base mouldings, of analogous proportions to the doors and windows; and a capital or cornice moulding and cap or blocking, as a termination to the shaft. The materials of the chimney-tops ought in general to be superior in quality to those of the walls; for example, if the walls are of rubble stone, the chimneys should be of stone squared and dressed. When the walls are of earth the entire stack of chimneys will of course be built of brick or stone.

5. When the flues of the chimneys are carried up in the outer wall, there ought always to be a projection outwards in that wall, beneath the chimneys, carried up from the ground, so as to give the necessary space for the flues, the strength of a buttress to the wall, with a sufficient breadth for supporting the chimney-tops, and the architectural expression of all these purposes.

6. Eaves-gutters, and ridge and hip coverings, with similar details essential as "finishings," as well as for habitableness and comfort, should never be omitted. The eaves-gutters should be properly supported by brackets, these being of stone or brick, except in the case of earthen walls, where they ought to be of wood.

7. Over the front door or porch of every cottage there ought to be a worked stone, on which should be cut the name of the cottage, the initials of the first occupant, a number, a sign, or some distinctive mark of the cottage, by which it may be registered in the Book of the Estate. See § 2327.

8. In rendering cottages ornamental, the most important parts and members of structure are those on which most decoration should be bestowed; such as the porch, entrance door, window of the principal room, upper parts of the gables, chimney-tops, &c.: and, in ornamenting each particular part, the most important details of that part should receive the highest degree of decoration; for example, the hinges and latch or lock of a door should be made richer than the muntings and styles, and the muntings and styles richer than the panels; and, hence, a door in which no ornament is bestowed on the latch or the hinges ought not to have the muntings, styles, or panels, studded over with ornamental nail-heads, as is often done.

9. Nothing should be introduced in any design, however ornamental it may appear to be, that is at variance with propriety, comfort, or sound workmanship. The mind revolts at the idea of tacking the walls of houses with ornaments that have no connexion with construction or use.

2569. *For the Labourers' Cottages on Estates managed by Agents*, we would recommend a tour of inspection by a competent person, and a Report drawn up on their present state, and on the means of their improvement. The Report should include the character of the surface soil and subsoil on which each particular cottage stands; the state of surface and underground drainage; the aspect of the different sides of the cottage, and its shelter or exposure; the sources of water and of fuel; the state of the back-yard, &c., if any; the state of the garden; and the connexion of the cottage with the nearest public road. The cottage itself ought next to be examined as to plan and accommodation, height of the side walls, thickness of the walls, roof and gutters, floor,

windows, stairs, fireplace, bed-rooms, exterior appearance, &c. The Report should then point out the additions and alterations necessary to render the cottage what it ought to be, illustrating these by plans, sections, and sketches, and giving lists of fruit-trees and shrubs, where these are wanting for the garden. Would that we could hear of some of the first landed proprietors in the country having such Reports made on the labourers' cottages, and the school-houses, on their estates! The practice would soon after become general, and the good that would ultimately result to the cottager and his children, and the accession of beauty, and appearance of comfort, to rural scenery, would be immense.

To be a possessor of landed property, we consider the greatest worldly privilege which any man can enjoy. No other kind of property is calculated to afford to the possessor so much rational enjoyment, whether in the occupation required for its cultivation and improvement, or in the recreation which it procures in its embellishment. In many, if not in most, cases, landed property enables its owner to contribute, in a more immediate and direct manner than many other kinds of property, to the happiness of his fellow-creatures by improving the dwellings of those who reside on it; and it enables him to procure the applause of the public, by combining improvement with embellishment in such a manner as to render his estate an ornament to the country in which it is situated. There are few or no landed estates which do not include a number of habitations, more or less scattered over the land, occupied by the humblest and most helpless class of society, common country labourers. These dwellings, as we have seen (§ 2233.), are in many places miserable within, and in few are they respectable without. Now our earnest desire is, to direct the attention of landed proprietors to this subject. On some estates the cottages may be already sufficiently comfortable; but in much the greater number we know that this is far from being the case: and what is lamentable, but nevertheless proved to be true beyond all doubt, is, that on those estates in which agriculture is arrived at the highest degree of perfection, for example, in the North of England and the South of Scotland (see Dr. Gilly and Mr. Donaldson in § 2233.) the cottages of the farmers' labourers are far worse than they are any where else. We would entreat landed proprietors to examine the cottages of their labourers themselves, or institute inquiry into their condition by competent persons. We would suggest that increasing the comforts of the labourer's home is the most effectual means that can be taken, not only for rendering him a better member of society, but a better labourer; and there is, also, no doubt that he will be more likely to bring up his family in moral and industrious habits. (See the description of an improved cottage and its occupants in p. 1126.) It used to be alleged by some that increasing the comforts of cottagers only increased their numbers, and ultimately added to the mass of misery among this class; but this opinion has more recently been found to be erroneous, for thinking parents, who possess a strong sense of comfort and future enjoyment, will not risk the diminution of the sources of happiness by burthening themselves with large families. As a proof of the effective working of this principle, we refer to those parts of Germany where the labouring population are highly educated; as for example, Austria, Bavaria, Wurtemburg, and Prussia.

The power of improving the health and adding to the comforts of a number of individuals, who in a great degree look up to and are dependent on us, must surely be a source of happiness to every rightly constituted mind. The increased attachment of the benefited party that will thus be produced ought equally to be a source of gratification; independently altogether of the increased value to the property, by more durable habitations, stronger and steadier workmen, and by families less likely to become paupers, vagrants, or pilferers.

The improvement of labourers' cottages recommends itself to the landed proprietor in another point of view, viz., the ornament which such cottages will confer on his estate. What can have a more miserable appearance than a wretched cottage out of repair, and without a garden? No one blames the cottager for this state of things; but the idea of a thoughtless or inhuman landlord, or of an unfeeling mercenary agent, immediately occurs. What, on the contrary, gives a greater idea of comfort, and of an enlightened benevolent landlord, than to see every cottage on his estate rearing its high steep roof and bold architectural chimney-tops, indicating ample room and warmth within; the whole in good repair, and surrounded by fruit-trees, in a well stocked and neatly kept garden? Every one, in travelling through a country, must have observed how much of its beauty depends on the state of its cottages and their gardens. We would, therefore, entreat the possessors of landed property to consider how much of the beauty of the country depends upon them; and we would farther beg of them to ask themselves, whether it is not one of the duties entailed on them by the possession of landed property, to render it not only beneficial to their families, and to all who live on it, but ornamental to the country.

GLOSSARIAL INDEX.

A.

ABACUS, a square forming the upper member of the capital of a column, on which the architrave rests.

Abutment, the solid part of a pier from which an arch springs; or, in carpentry, the junction of two pieces of timber, one supporting the other at right angles.

Acroter, a pedestal on the summit of a column for supporting a statue.

A. M., finding all materials.

Angle of repose, the point up to which an arch may be built without centering.

Antæ, pilasters attached to a wall.

Antefixæ, in Grecian architecture, ornamental terminations to the raised joints of the tiling.

Anthracite, or *blind coal*, a species of coal, found principally in Wales, which gives out very little smoke during combustion.

Apex, summit.

Apron for a veranda, ornaments attached to the lower side of the gutter in front.

Arabesque, a fanciful kind of ornament, comprising a great variety of objects, brought together apparently without any reason, yet so arranged as to produce a harmonious effect.

Architrave, ornamental bordering to a door or window; also a part of an entablature.

Arris, a projecting angle.

Arris girders are thicker in the middle than at each end.

Artesian wells, wells formed by boring, first practised at Artois, in France.

Ashlar work, rough stone laid in irregular courses.

Ashlering, partitions for lath and plaster.

Astragal, a fillet moulding with a rounded edge.

B.

Back laps, the parts of a shutter which fold back behind the part seen.

Bailey's composition, a kind of cement made of one part of limestone, recently burned, and mixed immediately after being slacked, with three parts of clean sharp sand.

Balk, or *Baulk*, a tie beam.

Baluster, a short circular pillar, generally supporting a rail. The word balu-ter is derived from the Greek, and signifies a wild pomegranate, from balusters being generally made tapering at both ends, and swelling out in the centre, like the form of that fruit.

Bands in Norfolk, strap hinges.

Banker, a stone or wooden bench.

Barge boards, ornamental finishings to the gable end of a house.

Barge stones, a corruption of verge stones.

Barn-door lift, ledge to prevent the corn from falling out of the barn when it is threshed.

Barrel curb, a cylindrical frame of wood, used in sinking a well.

Barrel drains, cylindrical drains made of brickwork, generally from nine inches to a foot in diameter.

Bartisan, a watch-tower in an old Scotch manor-house or castle.

Bast matting, Russian mats made of the inner bark of the lime tree.

Bat, a strong piece of iron passing through two boards to fasten them together, and secured by a screw nut on both sides.

Batted. Iron rails are said to be batted when they are put into holes cut for them in stone or brickwork, and rendered firm with melted lead.

Battened floors, floors laid with narrow boards, only one inch and a half thick.

Battening, pieces of wood fixed to the bond timber in the walls, at regular distances, on which laths are to be nailed, and either covered with plaster or canvass for papering.

Battens, narrow boards.

Battering, sloping inwards.

Bay window, a projecting window on the ground floor, generally consisting of two bevelled sides and a centre.

Bays, divisions of a barn.

Bead and batten, a cheap kind of entrance door, formed of wood only one inch thick, and finished with a circular moulding on the edge. Doors of this kind are only used for cottages, and they are generally strengthened by cross bars inside.

Bead and butt doors, framed in panels, with the beads struck only on the panel side.

Beam-filling, filling up with brick-work the interstices in the walls between the ends of the beams.

Bedding and pointing, laying a quantity of mortar for either bricks or timber, and when they are laid, smoothing the mortar on the outside, so as to fill up all the interstices.

Bell trap a contrivance to prevent the rising of bad smells.

Bevelled, sloped off in a slanting direction.

Bilgets. wooden bricks.

Binders, tie beams.

Binding joists, horizontal pieces of timber in flooring, lying in a transverse direction to the girders.

Bird's-mouth splay, an oblique angle to a tower, instead of a sharp corner.

Blasting rock, splitting them into fragments by means of gunpowder.

Blinded, a term applied to a causeway which has been made of small broken stones, and had the interstices filled up, so as to render the surface smooth, with clean water sand.

Blocked, small pieces of wood fixed at the back of skirting or wainscot, so as to keep it a little distant from the brickwork or partition.

Blushes in plastering, blisters.

Bolection mouldings projecting mouldings.

Bond stones, stones running through a wall at right angles with its face, so as to bind it together.

Bond timber, horizontal pieces of timber built into the wall to strengthen it.

Bonnet blinds, outside blinds, projecting from the window like the front of a bonnet.

Bore of a pump, the hollow inside

Bosses, projections in plaster work, occasionally used for suspending a chandelier, &c.

Bothy, a hovel used for labourers to take their food in.

Bow window, a projecting window on the ground floor, made semicircular or curvilinear.

Box beds, beds made of wood fixed in the wall, like berths in the cabin of a ship.

Boxed in, filled up completely.

Boxes for blinds, a framework of wood fixed on the outside of a window, to protect the outside blinds.

Boxes for hunters, stables containing each only one horse.

Braces, diagonal pieces of timber.

Bradded, fastened by small nails without heads, which are sunk into the wood, so as not to be seen.

Breaking joint, laying bricks or tiles in such a manner as to have the joints of one line come midway between those of the former line.

Breaks forward, projects.

Breast tree, a horizontal rail put in front of the manger in a stable, to which the staples and rings are attached for fastening the horses.

Breast water-wheels. wheels which are moved with

water running under the wheels. They differ, however, from under-shot wheels, since the principal power is derived from the weight of the water, and not from its impulse.

Breast summers, girders.

Brick coins, corners made of brickwork.

Brick dressings, bricks ornamentally arranged over doors and windows.

Brick nogging, a framework of timber filled in with brick.

Brick-on-edge walls, thin walls built with the bricks laid edgeways, instead of flat.

Brick trimmer, a brick arch.

Bricks laid in bed, a kind of brick nogging, so contrived that the bricks shall not project beyond the wooden framework.

Bridging joists, lying parallel to the girder, and to which the boards of the floor are nailed.

Bridled, trimmed.

Broached, pointed.

Broached ashlar, rough stone work, with the interstices filled up with mortar.

Broached tails, a regular breadth on each side of the angle of corner stones hewn smooth, while the remainder of the stone is left rough.

Buhl work is a term applied to borders of coloured wood or metal, let into articles of furniture. The process is as follows: — Two pieces of veneer, of two colours, are put together, with paper between them, each being glued to the paper. Upon the surface of the upper one is placed the print or drawing of an ornamental border, the outlines of which are cut through by means of a very fine saw, made of a watch-spring. The parts are then separated: that which was taken from the dark wood is let into the light wood, and *vice versâ*.

Built in the heart, a wall built solidly, and not filled up in the middle with rubbish.

Bull's-eye, a circular opening left in the upper part of a building for the sake of ventilation.

Bull's-eye rack, a crescent-shaped iron rack projecting from the wall.

Butt and ben (Scotch), a kitchen and a parlour.

Butt hinges, hinges which, when expanded, form a square. (See *fig.* 65.)

Byres, cow-houses.

C.

Cabers, laths for thatch.

Calorifere, apparatus for heating by hot water.

Campanile, bell turret, or watch tower.

Canted corners, corners, the sharp angle of which is cut off.

Canterbury, a stand for holding music books.

Cantilevers, blocks of wood or iron built into the outside wall of a house at regular distances, so as to project at right angles from it, to support such mouldings as may be placed on them, or more generally the eaves of the roof.

Cap of a chimney, the upper and projecting part of the shaft.

Cap of a mill, the upper part of a mill, to which the sails are attached, and which is so contrived as to be turned, so as to enable the sails to be acted upon by the wind.

Capotum, a Hindu torus moulding, with an ornament like a pigeon's head at the termination.

Capping, the coping or covering to panels of woodwork.

Carcass of a building, the brick framework of a house before the interior is finished.

Carriage of a staircase, pieces which bear the brackets till the steps are fixed.

Cart sheds, the Scottish term for cart sheds.

Carved trusses in furniture, projections or brackets, appearing to be designed for supports.

Castrametation, camp making, or the science of forming camps.

Catacombs, or *bins*, brick divisions in a cellar for holding wine.

Catch, an iron bar three-quarters of an inch square, for keeping a folding-door fast when shut. It has a ring at one end for fastening to the wall with a staple, and is bent at the other end, so as to hook into the door by another staple on the inside.

Causewayed, paved with pebbles or irregularly-shaped stones.

Cavetto, a species of curved moulding forming the outer line of the segment of a circle.

Cella, the part enclosed by walls in a Grecian temple.

Cenotaph, an architectural building raised as a monument or memorial of the dead.

Centre-point hinges, swing hinges, made either with the pivot of the edge turned down, so as to work in an iron socket let into a stone, or with two pivots working on two hooks; the object in both cases being to make the points of rest of the gate the same as the shutting point.

Centring, frames of timber by which the brick or stonework of an arch is supported during the time of its erection.

Chace of a cider mill, is a circular trough in which the apples are put to be crushed by the revolving circular stone.

Chacked, notched or slit, so as to fit the piece to be joined to it.

Chain-work, horizontal bond.

Chamfered or *Champhered*, rounded on the corners, generally applied to gate-posts made of a square piece of wood.

Chased, lead let into the brickwork.

Chasings, openings cut in the brickwork for lead.

Checked down on, notched one into another.

Cheek, or *plate*, the piece of wood in the lintel of a doorway, against which the door shuts.

Cheek-pieces, pieces of wood in a cow-house, between which is placed the cow's head.

Chevron, indented moulding in the Anglo-Norman style.

Chimed, let in neatly.

Chimney bar, a strong iron bar placed across the mouth of the chimney to support the breast-work or front part of the flue.

Chimney pot, a short funnel, made of earthenware, metal, or artificial stone, frequently placed on the summit of the chimney shaft, to prevent smoking.

Chimney shaft, called in Scotland chimney stalk, is the part terminating a chimney or flue, which is carried up above the roof.

Chimney stack, a number of chimney tops joined and placed on one base.

Chimney stalk. See *Chimney shaft*.

Chamon, an Indian plaster or cement.

Cill. See *Sill*.

Cincture, a ring or fillet, serving to divide the shaft of a column from its capital, or base.

Clamp kilns are nothing more than stacks or masses of bricks interspersed with coal cinders.

Clamped, when applied to a kitchen table, signifies that each flap or leaf is bordered at the end by a piece of wood the reverse way to the grain of the wood of which it is composed. The clamp is generally grooved, and the wood of the table tongued into it. (See page 306.)

Cleaded, clothed.

Clere story, the centre of a church which rises above the two aisles.

Clinkers, small bricks burnt very hard.

Coins, corners.

Cob walls are composed of earth and straw mixed up with water, like mortar, and well beaten and trodden together.

Cockles, iron furnaces with inverted iron pots, for generating heated air.

Cogged, notched.

Columns, a member, in architecture, the plan of which is circular, and which consists of a base, a shaft or body, and a capital.

Combed wheat straw, straw from which the ears of grain have been cut or combed off, instead of being threshed, and the straw of which is consequently unbruised by the flail.

Composition floors, floors formed of one part of quick-lime, two of sharp sand, and as much oil of any kind as will bring the other ingredients to the consistence of mortar.

Concrete, a mixture of clean gravel, or sharp sand, and quick lime, mixed while the lime is still hot.

Congee, a species of moulding which consists of a straight line, curved in at the bottom.

Conservatory, a house for keeping exotic plants, either planted in the soil or in large tubs. When the plants are kept in flower-pots, on wooden stages, the house is called a green-house

Consol table. The term consol is applied from the form of the front legs or pillars by which such tables are usually supported, which is that of a carved ornament called a consol, frequently placed on the front of brackets, and on the key-stones of arches.

Coping, a covering laid on the top of a wall, generally projecting beyond the wall on both sides, and being of a different material from it.
Copper brazed, joined together by heat, in the same manner as soldering.
Corbel stones, stones projecting from a house so as to support the roof, the ends of which are often carved.
Cored, a word applied to chimneys when they are cleared of the pieces of mortar and other rubbish left in them while building.
Cornice, a moulded projection, which crowns or finishes the member to which it is attached.
Corona, the crowning member of an entablature.
Corrugated, wavy, wrinkled, or fluted.
Cotteral, a spring wedge. (See *fig.* 986.)
Couch frame in a malt house, a square frame, formed of boards, 30 inches in depth, in which the barley lies after being steeped.
Countesses, a particular kind of slate (See *Slates*.)
Couplings, or *couples*, principal rafters
Coursed rubble work, courses of unequal height, but of hammer-dressed stones.
Coved ceilings, ceilings made high in the centre, but slanting in the corners of the room.
Coved plates, metal plates used in fire-places to throw the opening into a semicircular form.
Crabs, machines for being attached to and raising heavy weights.
Crank, a piece of brass used to connect two wires together. (See *fig.* 271.)
Crippled walls, walls of cob, mud, or other soft material, which have swerved from the perpendicular in consequence of having been built too rapidly.
Crockets, studded or curled ornaments, running up the upper edge of a gable end or pinnacle, and terminating in a pointed ornament or finial.
Crooks and bands, hook and strap hinges.
Cross-tailed hinges, strap hinges, with a cross sometimes shaped like a trefoil at the end.
Crown glass, glass that is white or colourless.
Crowsteps, the coping stones of a gable rising one above another, like steps.
Crypt, an underground church, or vaults used as a church.
Cubic inches of surveyors. What surveyors call a cubic inch is the twelfth part of a cubic foot, and equal to 288 common cubic inches.
Culms, the hollow stalks of any reed, corn, or grass.
Cupples, couples or rafters.
Curbed, contracted towards the ceiling by being carried up into the roof.
Currented, laid to such a slope as to carry off water.
Curtailed step, the bottom step of a flight of stairs, which is longer than the others, and made to curl round in the same form and manner, and to the same extent, as the scroll of the hand rail.
Cusps, points formed in the upper corners of a window by uniting two curves.
Cyclopean walls, walls built with land stones heaped upon each other without mortar.
Cylindrical, a tube circular in the section.
Cyma recta, a moulding, the outline of which is formed by two curves, the upper one concave and projecting, and the other convex and receding.
Cyma reversa, curves outwardly and projecting at the base, and inwardly and receding at the upper part.
Cyma talon, or *ogee*, curves inwardly at the base, and outwardly forming a projection at the upper part.

D.

Dado, the flat side of a pedestal, between the plinth and the cornice; applied also to the space between the skirting and the chairs' back moulding in rooms.
Dais, raised platform.
Deal keys, the same as strutting pieces, that is, pieces of timber driven fast between each pair of joists, with their butting against the grain of the joists
Deal matched, the edge of one board grooved, and that of the adjoining board tongued, so that one may fit into the other.
Deal slips, very thin boards.
Deals, boards sawn to a proper thickness for use.
Dentils, from the Latin word *dens*, a tooth; small square blocks or projections, used in the lower mouldings of cornices. The breadth of dentils should be half their height; and their intervals, according to Vitruvius, two thirds of their breadth.
Discharging arches, arches built over lintels, to relieve them from part of the superincumbent weight.
Dish and current, a basin in the centre of a cattle yard, with sloping gutters to carry off the wet.
Distemper, a mode of colouring walls.
Distyle in antis, a portico of two columns between two pilasters.
Dog-legged staircase, a staircase in which the stairs rest on a spandril, or on what is called a string, on the one side, and are housed into the wall on the other.
Door bracket, a slight projection over the top of the door, to serve as a substitute for a porch, in protecting any one standing at the door from the rain.
Door of two leaves, or *folding door*, a door opening in the middle.
Door soles, door sills.
Dormer windows, windows in the roof.
Dots, broad-headed tacks or studs, used to fasten lead on roofs or in cisterns.
Double hung. Windows are said to be double hung when both sashes will pull up and down.
Dove-tailed, the end of one piece of wood cut so as to fit into a space left in another piece of wood. (See *fig.* 57.)
Doweled floors are nailed to the joists: but so that the nails are not seen. The first board that is laid is nailed on one edge, by the nails being driven straight through the board, the heads of the nails being afterwards concealed by the skirting; and, on the other edge, by nails driven in slanting, through about half the thickness of the board, to the joist below. Dowels or pins, either of iron or wood, are previously let into the board at given distances, one end of each projecting, in order that they may be fitted into holes made in the thickness of the next board, which is not to be nailed on the edge where it is joined to the first board. The whole floor is laid in this manner, each board being nailed only on one edge, and that through half its thickness, except the first board and the last, both of which are nailed on both edges, the nails, which would otherwise be seen on the outside, being hidden by the skirting. The dowels are for keeping the boards firm on the side on which they are not nailed.
Dowels, projecting points of either iron or wood.
Dragon ties, iron straps to tie together the wall plates at the external angles of the building.
Dram timber battens, narrow deal boards (supposed to be of spruce fir), from Drammen, a sea-port in Norway.
Draughted and broached, that is, worked smooth round the joints with a chisel about three-quarters of an inch on the face of the stone, while the remaining part is roughly worked with a pick.
Drawn, that is, when a house is covered with Roman cement, marked with lines to make it resemble stone.
Drawn about, carefully pointed with lime mortar mixed with hair.
Drawn battens, deal boards carefully selected, so as to be free from knots and other imperfections.
Dressed, rendered smooth by working with a tool.
Dressed paving-bricks, bricks smoothed on one side by passing a cylindrical rule, wetted, over them when they are just moulded and quite soft.
Dressing barn, the part of the barn set aside for separating the grain from the chaff.
Drip moulding, a projecting stone at the base of chimney shafts, or above windows.
Droved edges, the edges of stone worked smooth with a broad chisel, called a drove, which leaves its marks, somewhat like the squares in a very small chess board.
Drum, a cylinder upon which a belt works for turning machinery.
Drying floor in a malt kiln, is a floor made of cast iron, with an apparatus for heating it below.
Dunge, is the space between the kiln and the furnace in a malt-house.
Dynamics, the science of moving forces.

E.

Eaves, the margin or edge of a roof overhanging the walls.
Elbow buckets, partitions formed of two boards each, put together so as to form an angle or elbow, and used to catch the water in an overshot water-wheel.
Elbows of a window, the two pouched flanks, one under each shutter.
Endless cloth, a piece of cloth sewed together at the extreme ends.
Enfilade, a view seen through several rooms at once.
Engaged columns, columns attached to a wall, and projecting from it half or three quarters of their diameters.
English bond, walls built with alternate courses of headers and stretchers, stretchers being bricks so placed as to show their whole length in the face of the wall, and headers showing only the narrow part or head of the bricks.
Entablature, the horizontal mass placed on Grecian columns: it consists of three parts, the architrave, the frieze, and the cornice.
Epistylium, architrave.

F.

Façade, the principal front or elevation of a building.
Facings, architraves without mouldings.
Fall of land, thirty-six square yards.
Falling style of a gate, the style or post to which the latch is fixed.
Fan blinds, outside Venetian blinds projecting from the windows.
Fan groin, a particular kind of ceiling, consisting of a number of circles intersecting each other.
Fanners, a winnowing machine.
Fascia, a band or broad fillet; also the face of an architrave.
Feather-edged, boards rendered very thin at the sides.
Feeding-ports, openings furnished with small doors, hung on pulleys, through which food is given to cattle put up to feed.
Ferrol, a term used by plumbers for a brass tube, which is soldered to a lead pipe at one end, and then driven into the main water-pipe in order to supply a cistern.
Feuars, persons renting land for building on in Scotland, on leases for 999 years.
Fillet, a narrow vertical band. The slips between the flutings of pillars are also called fillets.
Filleted rooms, rooms in which the wood-work is ornamented by narrow strips of deal, so as to give the effect of fluting, mouldings, &c.
Filling in lintels, lintels placed behind the front lintels.
Finial, a pointed ornament, frequently placed at the summit of the gable end of a house.
Fir, as applied by builders, signifies Baltic timber; what they call pine being American timber, and generally considered of an inferior quality.
Fir keys, strutting pieces formed of Baltic timber. (See *Deal keys*.)
Fire bricks are formed of clay very free from sand or iron, which does not vitrify from heat.
Fire stone, stone that will stand fire without becoming calcined.
Fire wood, a kind of wood never exceeding 12 feet in length, and 6 inches on the side. These are the usual dimensions of the wood sold for fuel, which is always sold cheaper than timber.
Firrings, pieces of wood fixed on the joists under the boarding, to give a current to the water which may be used to wash the floor.
First floor. In Scotland the first floor is the ground floor; but in England the first floor is up one pair of stairs.
Flag stones, large stones split or sawn into thin laminæ, having a flat smooth surface.
Flanches, projecting edges in iron work, generally curved, for the purpose of uniting and strengthening the parts to which they are applied.
Flange. A flange is a projection round the edge of a pipe or other article in metal, to admit of its being fastened to a similar projection by screws or rivets.
Flank tree, valley rafters, that is, the rafters required to support the lower part of a roof.
Flap, the leaf of a table which can be let down when not in use.
Flashings, or *flushings*, strips of lead laid over joints.
Flat, in Scotland, floor or story of a dwelling house.
Flat-bedded stones, stones laid perfectly level, on the under surface.
Flat-ruled joint. A ruled joint is a joint struck flat with the trowel, with a line drawn in the centre by a small iron instrument called a jointer (see *fig.* 207.), and an iron straight edge or flat ruler.
Flatted crown glass is produced by heating the glass quite hot in an oven, on a flat iron plate laid perfectly level, to which the heated glass adapts its surface.
Flatted paint. Paint is said to be flatted when the glossy appearance is taken off by using turpentine in the last coat instead of oil.
Flemish bond, bricks laid with an alternate header and stretcher in each course.
Float, a kind of oblong flat trowel, with the handle fixed in the centre, used by plasterers.
Floats and float boards, the narrow boards or wings fixed on the circumference of undershot water-wheels.
Floor cloth, canvass or some other material painted with oil.
Flush, even with, not projecting.
Flush brass bolts, bolts let into the wood-work, so as not to project beyond the face of it.
Flushed up or *solid*, pointed or filled up smoothly with mortar.
Fly brackets, brackets used to support the flap of a table, but which push back or fold up when the flap is not in use.
Flyers, straight steps.
Fly wire, wirecloth or *toile métallique*, for putting in windows to admit the air, while it excludes the flies.
Foddering bay, a place in a stable or cow-house for keeping green food.
Foddering passage, for conveying food to cattle.
Foils and cusps, small arches meeting in points.
Folding camp bed, a bed so contrived as to fold up and put away when not in use. (See p. 329.)
Folding doors, doors composed of two leaves opening in the middle.
Folding floors. When these floors are laid, the first and fourth boards are nailed down with brads (small nails made without a head, in order that the nail may be sunk in the wood), in such a manner as to leave an intervening space, something less than the breadth of the second and third boards, so that when these two last are placed, they rest as it were folded together, forming a ridge, on which the workmen jump till they have forced the second and third boards down into their proper places, the object being to have the boards fit as tight as possible. (See p. 239.)
Folding gates, gates opening in the middle, or hinged like folding window shutters, so that one part may fold back over the other.
Folding handles, handles that hang down, or fold aside, when not in use.
Folding hinges, hinges so contrived as to fold back, or pieces of girth webbing or leather, nailed alternately to one side of one hanging style, and the opposite side of the other. (See *fig.* 731.)
Folding register grate, a grate contrived with doors which are in two parts, and each part in four divisions hinged to each other so as to fold back over each other when not in use. (See p. 697.)
Footings, the lower courses of a foundation.
Fotherum, the Scotch name for the passage by which the fodder is conveyed to a cow house.
Framed work, frames of wood, having the panels filled in with mud, lath and plaster, turf, &c., to serve as walls.
freestone, any stone that can be worked by the saw and chisel.
French casements, windows opening in the middle, and hinged on the sides.
French polish, a kind of varnish used for polishing furniture.
Fresco, painting in water colours on plaster, which is newly laid on, and has not set.
Fret, an ornament consisting of one or more fillets at equal distances, either vertically or horizontally.
Frieze, the flat sunk part of an entablature.

Frustum of a pyramid, the lower part, supposing the upper part to have been cut off horizontally.

G.

Gables, pediments of the roof. (See p. 223.)
Gable tops, the upper parts of cross walls.
Galilee, the name anciently given to the part of the church where corpses were deposited previous to their interment.
Galley, the kitchen of a ship.
Galloway cope, a coping formed of large irregular stones projecting on both sides of the wall.
Gangway, an inclined plane extending from the rick yard to the floor for unthreshed corn in a barn.
Gargells, or *gargoyles*, ornamented spout heads.
Garnet hinges, hinges with a bar attached. (See *fig.* 66.)
Garreted joint, a joint stuck with small pieces of stone.
Garron nails, six-inch spikes.
Gauge for tiling, is reckoned from the distance which the first and third laths are apart measuring from centre to centre. (See p. 427.)
Gauged arches, arches built with bricks ground down to the shape of truncated wedges, so that the lower part of the arch may form a straight line instead of a curved one. (See *fig.* 209.)
Geometrical drawing, a drawing made to a scale representing the flat side of a building.
Geometrical stairs, a staircase winding round, and having a circular well-hole in the centre
Gin wheel, a wheel with an upright shaft, and with the teeth or cogs in a horizontal rim.
Girders, the principal beams for supporting a floor.
Graining, a mode of imitating the different kinds of wood by painting.
Greek cross, a rectangular cross, the limbs of which are all equal.
Grey lime, lime produced by burning limestone, not chalk.
Grey stocks, bricks made of marly clay, or of clay mixed with chalk.
Grieve, the Scotch name for bailiff.
Grip, the Scotch word for gutter.
Groined roof. Groins are angular curves formed by the intersection of two arches which cross each other.
Grooves, slits hollowed out for some other substance to fit in.
Grounds, slips of wood built into the foundations of walls to fix the skirting to; also to secure the architraves of the doors and windows, and to support the walls over apertures.
Ground shot water-wheels, undershot wheels, that is, where the water is below the wheel.
Grouting, pouring fluid mortar into the joints of brickwork.
Gudgeon, a small pin which works in a socket.
Guilloches, a series of curved fillets.
Gussets, the string board of a staircase continued beyond the newel up to the ceiling, in a triangular shape.

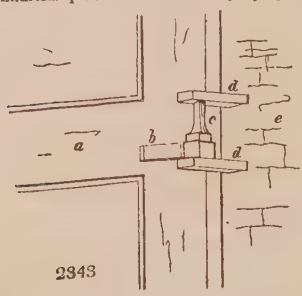
H.

Half couples, hip and valley rafters.
Half-tester bedstead, when the upper part projects only half way over the bed. (See *fig.* 688.)
Halved and spiked, a mode of joining boards together by cutting a piece out of each, so that they may fit one into the other. (See *fig.* 49.)
Halved on. Joists are said to be halved on when they are joined by half being cut out of the joist and half out of the rafter.
Hamlin's mastic, a calcareous cement which consists of earth pulverised, to which are added any of the oxides of lead and a quantity of glass or flint stones; the whole reduced to a fine powder, and intimately incorporated with any cheap vegetable oil.
Hammels, sheds for cattle to take shelter from the sun or rain.
Hammer-dressed, stone worked smooth with the chisel end of the hammer.
Hanging post, or *hanging style*, the post to which a gate is hung.
Harras, studs of horses.
Hardware, ironmongery.
Hard wood, oak, elm, and ash
Harling, rough casting.
Hatch hole, the opening left in the wall of a hen house for the fowls to go in.
Hatchway, an opening left in a drain or cistern for a man to descend to clear out the place.
Haunches of an arch, the part behind the springing of the arch.
Head-board, a board at the back of a bedstead, covered with part of the bed-hangings, and sometimes called the head-piece.
Headed stones, stones squared at the ends.
Head rail, the rail for supporting the curtains of a French bedstead.
Head style of a gate, the style to which the hasp for the latch is fixed.
Headers, bricks placed so as to have their heads to the surface of the wall.
Hearted and packed, the interior of a rubble wall filled in solid with mortar and chips.
Heel posts, the posts to which the stalls of a stable are attached.
Hewn works, works composed of hewn stone.
Hip rafters, rafters at the angles of a pavilion roof.
Hipped. A roof is said to be hipped when the ends present a sloping surface instead of a gable or pediment.
Hips, truncated parts of a roof.
Hips and valleys are formed wherever roofing meets at a right or other angle. (See *fig.* 226.)
Hobs, ledges by the side of a grate.
Holdfast, an iron instrument driven into a wall, to the flat end of which shelves may be nailed. (See *fig.* 246.)
Hollow worked frames, frames grooved so as to admit the panels. (See *fig.* 376.)
Hood moulding, a label rising over a door or window. (See *fig.* 188.)
Hoop chips are the shavings made by the coppice cutters, when splitting and preparing large hoops from long hazel and other rods grown in coppice woods; they are used like thatch. (See p. 435.)
Horns to doors, lintels with projections beyond the styles.
Horse-bed, the same as a folding bed.
Horsed, timber put up to dry.
Hot-plate, a plate of cast iron, about 6 feet long and four feet broad, heated by a furnace below to a red heat. On this plate are placed saucepans for boiling and stewing, and gridirons for broiling.
Hough, a Scotch word for hoe.
Housed, let into the brickwork.
House place, in Cheshire, is the kitchen.
Hummelling machine, a machine for taking off the awns of barley.
Hutches, small boxes, or dens, for keeping rabbits.

I.

In and out tie or bands, the same as headers and stretchers. (See p. 488.)
Inband rybats, headers.
In bonds, bond stones stretching across the wall.
Ingoings, jambs or sides.
Ingoing windows, windows recessed from the outside.
Inlaid floors, floors inlaid with common or different coloured woods, so as to form a pattern.
Intercolumniation the distance between the columns of any building.
Inverted arches, arches turned under a window or other opening, below the level of the ground, and intended to equalise the pressure of the foundations on the earth, and thus to prevent the sinking of one part more than another.
Iron brick, a piece of iron shaped like a brick, frequently made with openings in it, so as to form a grating, so as to act as a ventilator. (See *fig.* 1499.)
Iron shoes, cases of cast iron for the ends of pieces of timber used in the construction of roofs, or bridges of large span; also curved ends of spouts to carry off water.
Iron turn, a piece of iron, two or three inches long, with a square hole at one end, which works on another piece of iron of about the same length, fixed in the wall like the hook of a strap hinge, by means of two projecting studs. The lower part of this hook is square, so as to fit the square hole in the iron turn, and the upper part is cylindrical, so as to allow the turn, when lifted up, to move round upon it. Hence, to fasten back a

shutter, the turn must be slipped on the square part of the hook, where it will remain fixed; and, to relieve the shutter, the turn must be slipped up, so that it may move round on the cylindrical part. In the accompanying figure



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(*fig.* 2343.), *a* is the shutter; *b*, the turn; *c*, the pin on which the turn moves; and *d d*, the two irons into which the latter is riveted, and which are leaded into the wall, *e*.

Isometrical perspective is a term applied to a projection made in rays parallel to the diagonal of a cube, upon a plane perpendicular thereto, so as to give a clearer idea of a place than either a plan or a perspective view, as it may be said to combine both.

J.

Jambs, side-pieces.

Jib brackets, brackets that can be turned so as to lie flat to the wall.

Joggled on, one piece of wood let into another. (See *fig.* 50.)

Jointer, tools used both in building and carpentering.

Joists, pieces of timber between the beams for supporting floors.

Jumped, secured by a bolt passing through a hole made in the wall, and fastened with a nut on the other side.

Jumper, a blunt chisel used in boring holes in a wall or rock.

Jumping holes, made to contain the gunpowder required to blast or rend asunder rocks.

Jutted, projecting.

K.

Kiln tile, a particular kind of tile used for paving kilns.

King-post, the middle post of a roof.

Kneading trough, a trough for making bread.

Knot, an imperfection in a board, being the remains of a branch which was in the tree the board was cut from: when used as a verb it signifies to cover the knots in the wood with paint, before the wood is properly painted.

Knotted, the knots smoothed and filled up previously to painting.

L.

Labels. A label is an outer moulding crowning a door or window-head, either plain or carved, and always returned at the ends when straight. (See *fig.* 188.)

Lacing courses, vertical and horizontal bond.

Lancet window, windows formed with pointed or lancet heads. (See *fig.* 1616.)

Landing, a broad square stair used in the better kinds of staircase in the corners, instead of winders.

Landing stone, stones of remarkably large size, used to form the landing-places in stone staircases and other similar situations.

Lantern skylight, a skylight in the shape of a lantern, raised above the roof, and admitting light through the glass in the sides.

Latent, hidden.

Lateral thrust, the weight or other pressure of the materials sideways.

Lath, a slender piece of wood, generally used to support plaster.

Lath, plaster, float, and set. The laths are nailed over framework; they are then plastered, that is, covered roughly with mortar; afterwards a second coat of plaster is given, which is applied with an oblong trowel, having its handle in the centre, called a float, and lastly a smooth coat of plaster is applied, which is called setting.

Lathing diagonally, is nailing on the laths in an oblique direction, to lessen the chance of cracks in the plaster.

Lead aprons, strips of lead to overlap the flashings.

Lead-headed nails, nails, the heads of which have been dipped in lead to prevent their rusting.

Lean to roof, a roof, the rafters of which lean against the wall of another building.

Lime riddlings, pieces of lime that will not pass through a riddle.

Lime shells, a term for calcined lime, used in Scotland.

Lime white, to whitewash or wash over a wall with whiting mixed with water and size.

Lintel, the head piece of a window frame or doorway.

Listed boards, boards sorted, or rather matched, so as to make the floor appear all of one colour.

Listings, narrow strips of lime and hair, or cement, used to cover the joints.

Lithic paints, stone paints.

Loggia, a porch, open room, or small veranda.

Loose stable, a stable not having any divisions of stalls, or place for tying up a horse.

Lopers, sliding pieces of wood that draw out of a book-case or bureau, to support the sloping flap, and make it serve as a desk.

Louvert, a lantern.

Louvre boards, inclined narrow boards, arranged one above another, like Venetian blinds, but fixed in an aperture, so as to admit the air, but exclude the light.

Low-pitched roof, a roof where there is little slope from the ridge tiles to the eaves.

Low room windows, windows on the ground floor.

L., P., F., lath, plaster, and float.

Luffer boards, the same as louvre boards.

Luggage chair, a particularly strong and broad wooden chair to put in the bedrooms of inns to hold the luggage.

M.

M roof, a roof formed of two valleys.

Man-hole, an opening in a cesspool, drain, &c., large enough to admit a man to clean it out when necessary. Man-holes are usually fitted with a close cover when not in use.

Marqueterie, a mode of inlaying floors with different colours, so as to imitate mosaic work.

Matched boards, the edge of one board is grooved and that of the other tongued, so as to fit into each other.

Milled lead, lead pressed out to the required thickness by a machine.

Milled slate, slates sawn out of blocks by machinery, instead of being split in the ordinary way by wedges.

Minutes, subdivisions of Perrault's scale, for drawing the orders of classical architecture.

Mitre wheel, a wheel fitted in a particular manner, so as to work in another wheel.

Mitred. Slates are said to be mitred when two planes meet against a diagonal line.

Modillions, a species of ornament in classic architecture resembling a bracket.

Modules, equal parts into which a diameter is divided, for the purpose of facilitating its measurement or delineation.

Monied out, calculated.

Mortise holes, holes for the projecting ends of the wooden framework.

Mortised locks, locks which are inserted in a mortise cut edgeways in the style of the door.

Moulded nosings, the edges of steps which are exposed to view.

Mowsteads, frames of wood work boarded, carried up to the height of two or three feet in a barn, to separate the corn which is being threshed on one side, and the corn or straw on the other.

Mud walls are formed of clay worked with straw and then put into a frame 18 inches in length, 6 inches deep, and from 9 to 12 inches in diameter.

The lumps are afterwards dried, and then laid with mortar like bricks. (See p. 77.)

Mullions, or *munnions*, the fixed vertical divisions of a window, in both the Gothic and the Elizabethan styles.

Munting, the centre vertical piece which divides the panels of a door.

N.

Neckings, members which are always used on the top of a column or pilaster, in the Tuscan and Roman Doric orders, immediately under the cap.

Nick of a chimney, the part immediately under the caps.

Newcastle crown glass, the best crown glass.

Newel, the turning post of a staircase, that is, a post firmly fixed, to which the handrail of the staircase is framed. (See *fig.* 241.)

Nogging flat, brick nogging built with the bricks on end.

Norfolk latch, thumb latch.

Northumberland mortar is composed of one cart load of good well burnt lime (from limestone) mixed with three cart loads of clean sand, which are well mixed and beaten together before adding the water.

Nosings to stairs, the edge of the stair which forms the angle.

Nulling, a turned moulding, representing strings of beads.

O.

Octostyle, a building with eight columns in front.

Office houses, farm buildings.

Ogee moulding, called also cyma talon, a moulding nearly in the form of an S.

Open filleting, strips of deal nailed at one or two inches apart.

Open sparred frame, a frame filled in with lattice work at short distances asunder.

Oriel or compass window. An oriel window is a projecting window in an upper story.

Ordonnance, any order in classic architecture.

Overlap, is one substance lying a little over another.

Oversailing, protruding.

Overshot water-wheel, when the water falls from above the wheel.

Ovolo moulding, a quarter round or egg-shaped moulding.

Ovolo sash bars, sash bars finished with ovolo mouldings.

P.

Pace, a square landing-place dividing stairs into flights, and used to form a turn without winders.

Pair of grates. The front and bottom bars of common grates that are set in brickwork are called a pair.

Pagoda caps, for ventilation.

Palliasses, remarkably thick straw mattresses

Paneled piers, piers having sunk panels.

Panels, sunk surfaces in frames.

Pantiles, hollow tiles

Parapet, a dwarf wall, or palisading.

Pargetted. A chimney is said to be pargetted when it is plastered inside with a mixture of lime mortar, fresh cow dung, and loam.

Parquetted floors are floors laid with small pieces of wood of the same kind and colour, fitted into each other so as to form regular figures.

Patera, the representation of a cup or rose in bas relief; a common ornament in stone work.

Pavilion roof, a roof hipped or sloping equally on all sides.

Pebble-dashed, plaster sprinkled, while quite rough and wet, with small pebbles.

Pebble-paved, laid with small round stones, generally in some kind of pattern.

Pendants, an ornament in the centre of a barge board. (See *fig.* 181.)

Penstones, arch stones.

Penthouse, a roof projecting from a wall and not supported by pillars.

Pends, or *pens*, ridge pieces of a roof

Pier, a pillar without any regular base or capital.

Pigeon-hole manner of building walls, leaving out a brick occasionally.

Pilaster, a rectangular pillar attached to a wall.

Pillar, an upright support of some regular figure in the plan.

Pine. This word is used by builders to signify American deals.

Pining, shrinking.

Pinnacle, a pointed ornament terminating a pediment or gable.

Pinned, let into a wall by a hole cut for the purpose.

Pisé, walls formed of mud or clay rammed into moulds.

Pitched roof, a roof which is highest in the middle, and slanting on both sides.

Pitched yards, paved yards.

Pivot, a point on which a hinge turns.

Place bricks, soft half-burnt bricks

Planceer, a moulded capping to the stringing board, into which the balusters of a staircase are fixed.

Planished. A planished surface is one that is first polished and then pressed by a stamp with a smooth bright dye.

Planted, fixed.

Plate of the stair, first landing-place (Scotch).

Plate glass, glass cast in a mould instead of being blown.

Platting course, a brick flat arch over a brick on edge one.

Plinth, the lower part of a column.

Ploughed and tongued, a groove made in one piece of board, and a projection left in the one that is to be joined to it.

Plugged, nailed to plugs of wood driven into the wall

Pointed, mortar finished smooth between the bricks.

Pointed architecture, a kind of Gothic.

Pole plate, a beam, or piece of timber, supported on the ends of the tie beams or principal rafters of a roof, over which are fixed the lower ends of the common rafters.

Polished pavement, stone pavement rubbed smooth.

Press bedst ads, bedsteads that fold up so as to resemble a wardrobe or a chest of drawers

Prime, the first coat of paint.

Principal quarters, the upright pieces of timber in a partition.

Principals, principal rafters.

Profile chimney pieces, are such as have projecting jambs, with their sides covered with marble or stone.

Proper boxings. The frames which receive the architraves of a window, and the outer edges of the shutters, are called proper boxings when they are wrought, framed, rebated, splayed, and beaded.

Proper door-cases are those which are wrought, that is, planed, framed, rebated, and beaded.

Proper ledged door has the boards planed, tongued into each other, and beaded. They are placed vertically, and nailed to horizontal pieces at the back called ledges.

Properly gathered, the flues of a chimney drawn in above the fire place till they are of a proper size to secure a good draught.

Puddled Puddle is a mixture of clayey loam and water, well incorporated together; and to puddle is to place this material in a stratum in any position where it will prevent water from penetrating through.

Pugmill, a machine for working and kneading clay before it is made into bricks

Pugging is a substance generally composed of sand, plaster, and hair, laid between the joists of a floor so as to fill up the space between the boards and the ceiling of the room below.

Pulborough stone, a species of green sandstone, which is found to resist the action of the water.

Pulley rack, the contrivance affixed to the sides of window frames for drawing up the blinds.

Pulley style, the hollow space in the window frame which contains the pulleys, lines, and weights for balancing the sashes.

Punchions, short pieces of timber used in framing partitions.

Purlins, horizontal pieces of timber, supported by the principal rafters of a roof.

Puzzle latch, a substitute for a lock, contrived so as not to be opened by a person who does not understand it

Puzzolana, volcanic earth, or rather decomposed

lava, found near Naples. It consists of silica, alumina, and oxide of iron, and is used principally to form cement under water.

Pyramidal label, a label rising in a pyramidal manner over the moulding of a door. (See *fig.* 1625.)

Pyroligneous acid, an acid extracted from wood.

Q.

Quarries of brick earth, square paving-tiles.

Quarries of glass, very small square panes.

Quarry-stone, stone cut into the shape required in the quarry, and consequently not so carefully prepared as that cut in the mason's yard

Quartering, quarters are formed of upright pieces of timber, to which laths are nailed. Formerly a tree, after being felled, was first sawn up into four equal parts; and hence the origin of this term.

Queen posts, the side posts of a roof

Quill of a fountain, the upright pipe through which the water rises.

Quirk moulding. A quirk in a moulding signifies a sharp turn.

Quoins, corners.

R.

Rab and dab. This term is used when cob (that is earth and straw mixed with water) is used for filling in partitions instead of brick nogging.

Rabbet heads of windows. The rabbet head of a window is a Scotch term for what is called in English the reveal or outside jamb of a window.

Race for tail water, space left for carrying off the surplus water of a waterwheel

Rack and horse, contrivance for raising a writing desk to different slopes (See *fig.* 610.)

Rack in a stable, space for containing the hay for a horse to eat.

Ragalets, grooves.

Ragged, let into a wall or post.

Raglings, ceiling joists.

Rails, the cross pieces of a frame.

Raising plates, wall plates.

Rakes. To cut a rake, is to reduce to a smooth slope the face of brick-work, which has been left in a rough state.

Raking torus wall, building a sloping wall by the side of a staircase to support the steps and risers.

Ramp, inclined plane.

Ramped cap, crossing to the partitions between the stalls made sloping or curved. (See *fig.* 779.)

Random-jointed ashlar work, stones laid irregularly, so as not to form proper courses.

Rebated laths, laths cut so that the upper half is higher than the lower half, so that when they are used in slating, the slates fit close, and can be nailed in the middle. (See *fig.* 1099.)

Reduced brickwork. In estimating the price of brickwork in Britain, the quantity, of whatever nature and thickness it may be, is always reduced to walls of one and a half brick in thickness, 272½ square feet of which form a rod of brickwork.

Reduced stonework. Stone walls are reduced to one and a half brick in thickness.

Reed, combed wheat straw, that is, straw that has had the heads cut off and not been threshed.

Refectory, a hall used in religious houses, such as monasteries, &c., for dining in.

Register, a contrivance for contracting the throats of chimneys by a plate of cast iron (See *fig.* 543.)

Reigner work, ornaments made by inlaying wood in the manner of buhl work, with leaves, &c. of different colours.

Render float, putting the first coat of plaster on brickwork.

Render set, first and second coats of plaster in two coat work.

Reveals, the exterior sides of a window.

Ribbet. See *Rabbet heads*.

Riders, bands built into the wall.

Ridge and piens, angles of the hips.

Ridge pieces, pieces to support the apex of a roof.

Ridge roll, a piece over which the lead is turned which covers the ridge and hips of a roof

Ridge spikes, nails with large heads for fastening on the lead.

Ridges of planks, gutters in the valleys.

Rigger, a smooth cylinder, fixed upon the end of a shaft that couples to the drum-shaft of the threshing-mill.

Riser, the upright part which supports the flat part, or tread, of every step in a flight of stairs.

Rising boards, boards belonging to a water-wheel, the use of which is to prevent the water from flowing over the float-board into the interior of the wheel.

Riveted, two pieces united by an iron pin being put through them, and fastened on the other side.

Roach-bellied laths, that is, laths which form the segment of a circle on the under side. (See p. 598.)

Road metal, broken stones and other materials used for making or mending roads.

Rod-bolts, bolts that pass through three rings. (See *fig.* 68.)

Rolls, pieces of wood rounded to dress the edges of the lead over.

Roofs of a low pitch, roofs not much elevated in the centre.

Roofs pointed to the pin, mortar laid under each course of slate from the lower edge to the pin that fastens the slate.

Rose window, a particular kind of ornamental window. (See *fig.* 1620.)

Rough arches, arches prepared to have discharging arches over them.

Rough wall, stone rubble-work.

Rough casting, plastering the outside of walls roughly with a mixture of lime, fine gravel, and water.

Rounding the chimney-breast, contracting the throat of a chimney to improve the draught.

Row of blockings, a row of projecting blocks of stone, or of projecting bricks, sometimes called a blocking course.

Rubble-stone, stone rough from the quarry.

Rule joints, joints like those of the common foot-rule.

Run, as used by plasterers, meaning to form a moulding, &c. The word is also used by plumbers to signify pouring melted lead round a piece of iron, let into a hole in stone or brick-work, to render the iron firmer.

Run, or *lineal measure*, length in a straight line.

Run beams, front rails.

Run channels, gutters.

Run tree, a rail fixed along the tie-joists.

Run with lead. See *Run*.

Rungs, spokes.

Runner for a cider mill, a circular stone roller used for crushing the apples. (See p. 616.)

Runners, pieces of wood for the drawers to slide on, and to guide them.

Rusticated corners, with the joints channelled, or cut in grooves.

Rustic work, stones made rough on the outer surface, by tools. There are several kinds of rustic-work, the most common of which are the lined, in which the hollow marks are straight; and the vermiculated, or wormed, in which they are in curved or tortuous lines. (See *fig.* 1674.

Rybets, reveals.

S.

Saddle-bars, cross-bars to which the leadwork of glazing is fixed.

Safe lintels, inside lintels.

Sailing over, projecting.

Sails of a windmill, sails in the form of a trapezium, for catching the wind; usually nine yards long and two yards wide.

Sand dashing, rough casting.

Sapwood, the outside wood of a tree which is never properly matured.

Sarking, thin boards for lining, &c.; also boarding for slates, or lead to be laid upon.

Sash-all, a pierced plate of pewter.

Saw draughts, longitudinal slits made by the saw in a thick board, but leaving the thin boards thus formed attached at both ends.

Scagliola is a mode of finishing with stucco, in imitation of marble.

Scantlings, in carpentry, signify the breadth and thickness of timber.

Scappled, stones are said to be scappled, or scabbled when they are dressed with the pick end of the hammer. They are said to be draughted and scappled when they are worked round the edges

or joints with a chisel and hammer, dressed in the centre.

Scarp of a terrace, the upright wall in front.

Scarsements, sets back.

Scored, lined in imitation of stone.

Scotia, a species of hollow moulding, curved out so as to project more at the base than at the top.

Screw gutter, a gutter like a corkscrew, made to wind round a column or circular building.

Screw pin, a long pin ending in a screw, in order to pass through a thick substance and screw into a board on the other side.

Scribed. To scribe is to cut the edge of a board or fillet, so as to make it fit and touch every point of an irregular surface.

Scroll hinges, T hinges, with their projecting points terminating in scrolls.

Scuncheons, the bevelled parts of the elbows of the inside of a window opening, where the shutters are placed.

Set and rendered, plastered.

Set back hinges, hinges so contrived as to make the shutters fit close to the window when shut, and close back to the wall when open.

Set-off, a sloping face of masonry.

Settlements, when the foundation gives way unequally.

Settling pits, liquid manure tanks.

Shakes, fissures in the wood.

Shaped columns, balusters.

Shield or escutcheon of a lock, a piece of brass that turns over the keyhole when it is not in use.

Shingles, oaken boards used instead of slates to cover a building, and generally from eight to twelve inches long, and four broad, thicker on one side than the other.

Shoe, the part at the bottom of a water pipe, intended to turn the current of the water.

Shooting, planing the edge of a board straight.

Shouldered, slates are said to be shouldered when a thick layer of mortar is put on the upper part of a row of slates, to serve as a bed on which to lay the next row.

Shouldered in haired lime, the lower part of each row of slates bedded in lime.

Shutting point of a gate, the line at which the gate remains when it is shut.

Side arms, pieces of bond timber built into the sides of the openings for windows.

Sills, cills, or *soles*, large pieces of wood or stone fixed in the lower frames of doors and windows, so as to project beyond the wall.

Silvered plate glass, looking-glass.

Sink stone, a stone perforated with holes, in order that, when the dirty water in which dishes have been washed is thrown away, any spoons or other articles of value may be retained.

Sinking on. In making iron chairs and other articles of furniture, some of the parts are slipped on while quite hot, and this is called sinking on.

Sizes fixed for bricks. Building bricks are never allowed to be larger than nine inches by four inches and a-half, and the head two inches and a-half.

Skeleton roof, the wooden framework of a roof.

Skewback arch, a bevelled abutment, which serves instead of a common arch. (See *fig.* 45.)

Skew stones, the coping stones of a gable, commonly called barge stones.

Skirting, thin pieces of wood nailed against the walls of living rooms at their base.

Slabs of trees, trees of which only a piece on one side has been sawn off, so that they are flat on one side and round on the other.

Slate boarding, boards placed on the roof, on which to nail the slates: the same as sarking.

Slates are generally known by the following names, the sizes of each description being annexed:—Doubles, 1 ft. by 6 in.; ladies, 1 ft. 3 in. by 8 in.; countesses, 1 ft. 8 in. by 11 in.; duchesses, 2 ft. by 1 ft.; imperials and patent slates, 2½ ft. by 2 ft.; and Welsh rags and queens, 3 ft. by 2 ft. See *Wyatt's patent slates*.

Slates rendered, plastered inside.

Sleepers, joists to support a boarded floor, laid on the tops of dwarf walls.

Sleepy water, when water is conveyed to a fountain by pipes which are of the same diameter for a considerable distance, it is found to lose much of its power, and to become what is technically called sleepy, instead of rising up properly through the jet. See p. 990.

Slider, a piece of wood which pulls out in front from a chest of drawers, below the top, and above the first drawer.

Sliding hatches, covers or shutters fitted in grooves.

Sliding shackle, iron rods in a cow-house, on which a moveable collar is fixed for binding the cow.

Slip centres to arches, a slip of deal cut to the intended line of the soffit of the arch, and supported by an upright piece against each jamb. (See *fig.* 245.)

Slips, the marble or stone fixed to the jambs of a fireplace.

Slots, crossbars.

Small couple rafters of narrow houses.

Smithy, a blacksmith's forge.

Smock windmills are built of timber covered with narrow boards.

Snatch blocks, blocks of pulleys with hooks attached.

Sneck, a latch.

Soffit, the part of the architrave which projects over the columns; but the term is used generally for the underside of any horizontal projection.

Sole tree in a cow-house, the sill into which the posts, to which the cows are tied, are mortised.

Sorted in courses, generally applied to slates when they are laid so that the joints form regular lines.

Spandrils, the space between the springing of an arch and the flat surface it is intended to support; also the space forming the side of a flight of stairs. (See *fig.* 241.)

Span of an arch. The span of an arch is the distance between the two points from which it springs.

Spare-house, a place for a sick horse.

Spark-plate, a broad plate of cast-iron placed over the stone in a hop-kiln to reflect back the sparks, and prevent their reaching the hops.

Spars, the common rafters of a roof for supporting the tiling or slating.

Spiked, nailed with spike nails.

Spiral stairs, stairs winding round a newel, or a well-hole.

Spit, spade.

Spits, or broaches, short pieces of wood, steeped in water to render them flexible, and then bent into the form of staples, and used to fasten on the thatch.

Splashing walls, throwing colour upon them with a broad brush to give them the appearance of age by imitating weather stains.

Splat, the middle part of the back of a chair, which either connects the top and bottom rails, or the two side styles.

Spiayed, bevelled off

Splayed elbows, the bevelled sides of a recessed window.

Spongy bricks, porous bricks, from not being made of proper earth.

Springing course, the horizontal course of stones from which an arch rises.

Spring stay-irons, irons for keeping lattice windows open.

Spruce deals, boards of the spruce fir, *Abies communis*.

Spurs, lower stones of the sloping part of a gable, generally called summer stones.

Spur wheel, a wheel on the main shaft of a mill with the cogs or teeth standing outwards, the wheel operating on a pinion.

Square of carpenter's work, one hundred superficial feet.

Square of slater's work, one hundred square feet.

Stacked, set up to dry, horsed.

Stack of chimneys, several smoke flues united in one column, and generally carried up to some height above the roof of the building to which they belong.

Staff-heads, upright corner beads put at the external angles of chimney jambs, and in similar situations. (See p. 125. and *fig.* 243.)

Stalks for chimneys, chimney shafts.

Stanchion bars, supporting bars.

Standard grates, kitchen grates supporting themselves by feet in front.

Standard rack, a rack so placed that horses or cattle may eat from its top when standing, and from its side when lying down.

Standards, the upright pieces of deal to which the ends of shelves are fixed.

Stays, supports, generally of timber.

Steening a well or cesspool. To steen is to line with brick or stone.
Stell, in Scotland, is a square or circular fold, into which sheep are driven and fed.
Stenciling is said to be a corruption of stained ceiling, but it is now generally used for the walls of inferior rooms. A pattern is cut out in pasteboard or oil cloth, and being put against the wall, it is washed over with the colour which the pattern is to be, the rest of the wall covered with pasteboard being left white.
Step flashing, pieces of thin lead let into the joints of brickwork, so as to fall one above another.
Step gable, a gable, the outline of which forms a series of projections like steps.
Stink-trap, or bell-trap, a metal vessel for permitting the escape of water into a drain or sewer, without admitting the fetid air from the drain. (See *figs.* 222 to 224.)
Stock lock, a common kind of lock having wood at the back.
Stocks, sound, hard, well-burnt bricks.
Stone joggles, pieces of stone let into each other in the same way that boards are when they are joggled on.
Stone tablings, large stones.
Stones laid in random courses, land stones placed irregularly.
Stones prepared, cut so as to lie flat.
Stones properly headed, squared at the ends.
Stoothed, battened.
Stoothing, quartering.
Stops, a term variously applied, but chiefly to slips nailed on for doors or shutters to shut against, or for fixing work.
Storm-head windows, windows projecting from the side of a roof, so as to form a small gable. (See *fig.* 386.)
Story posts, posts for supporting a building.
Stourbridge lumps, that is, masses of burnt clay, 18 in. or 2 ft. long, 9 in. or a foot broad, and 6 in. or 8 in. thick.
Straighted, when the plasterer's work is made smooth and even by a board or float.
Straight-jointed floors are floors made of boards of the same width, but not joined so carefully together as doweled floors.
Strap irons are binding plates of iron.
Stretchers, bricks placed so as to have their length appear on the surface or outside of a wall.
String-course, horizontal band.
String-courses, marked and projecting lines of separation on the face of a building.
String moulding, a string-course decorated with an ornamental moulding. (See *fig.* 370.)
Strings of the stairs, the piece of wood above the spandril in which the steps of the stairs are fixed.
Struts, pieces of timber which support the rafters, and rest against the principal posts of a roof.
Strutting pieces, pieces of timber driven fast between each pair of joists, with their ends butting against the groin of the joists.
Stub mortise, a mortise which does not pass through the article mortised.
Stud work, framework.
Stuff, pieces of timber.
Stump bedsteads, bedsteads without any tester.
Styles, vertical side pieces of the frames of windows, doors, &c.
Stylobate, a pedestal.
Subsills, pieces of wood or stone sunk into the ground for gate posts to be fastened in.
Summer, a beam tenoned into a girder, to support the ends of the joists on both sides of it.
Summer stones, stones placed on a wall or on piers for the support of beams, or to form the lower angle of gable ends, as an abutment of the barge stones.
Sunk sills, the upper part of the sill of a window, sunk or grooved out so as to prevent the rain from driving under the sash.
Superficial measure, measure in height and breadth.
Surbase, the moulding round a room close to the floor.
Surface draining, cutting gutters along the surface of the ground.
Surplice pins, hat pins.
Sway of a curtain, the curved part of the drapery.
Swagged taper, iron legs or other supports of chairs or tables which are gradually tapered to the base.
Swagging applied to walls, swerving from the perpendicular.
Swill cisterns, cisterns for containing wash and pigs' meat.
Swill house, a place for preparing pigs' food.
Swing doors, doors hinged so as to open either way.
Swing hinges, centre point hinges.

T.

T hinges, hinges somewhat in the shape of the letter T. (See *fig.* 982.)
Tabling stones. See barge stones.
Tacks, small nails made of iron tinned.
Tacksman, the Scotch term for a tenant on lease.
Tallb ys, high chimney pots put on to prevent the chimney from smoking.
Tammy, a kind of coarse woollen stuff, generally highly glazed.
Tanks, square or oblong pits, lined with cement or metal, for holding water, liquid manure, &c.
Tarras, a volcanic earth, used as cement.
Tazza, a kind of flat wide cup, generally used for fountains. (See *fig.* 111.)
Templets, short pieces of timber laid under girders and beams to distribute the weight.
Tenons, small square or round projecting pieces of iron or stone, which are let into mortises or holes made to receive them.
Tessellated pavement, mosaic work composed of small stones, &c., called tesselæ.
Tethering stake, a stake for tying cattle to.
Therm, a pedestal increasing upwards for the reception of a bust.
Thill, or *train horse*, the horse which is put between the shafts of a cart or wagon.
Thorough, the space in which a water-mill works.
Three-barred doors, ledged doors with three backboards.
Threshing mill course, the circular space upon which the horse walks when turning the gin-wheel belonging to a threshing-machine.
Throated, grooved underneath.
Throughed, walls built with cross-tie stones.
Ticken, coarse twilled linen, generally striped.
Tie, a piece of timber or iron, acting as a string or tie, to keep two things together which have a tendency to fall asunder.
Tie beams, horizontal pieces of timber. (See *fig.* 54.)
Tie-joists, joists acting as strings or ties to keep two masses together which have a tendency to separate.
Tie-rods, iron rods answering the same purpose as tie-beams.
Tilters, tilting fillets.
Tilting-fillets, narrow strips of wood, used to give a slight inclination to the verge or border slates where they butt against brick-work, in order to divert the water. (See *fig.* 55.)
Tongued, cut so as to fit into a groove.
Tontine system, where a building is raised by subscription, and is to become the property of the surviving subscriber. (See p. 738.)
Ton weight, ship measurement.
Tooled. A stone is said to be tooled when it is hewn but not rubbed smooth afterwards.
Top plates, wall plates.
Top stones, the course of stones immediately under the coping, generally in single blocks.
Torched, slates plastered at the crevices on the under side, to keep the wind out.
Torus moulding, a semicircle between two rectangles. (See *fig.* 240.)
Tower windmill, a windmill built of brick.
Tracery, various figures cut in stone, and generally laid on other stones. (See *fig.* 1617.)
Transepts. When a church is built in the form of a cross, the two shorter limbs are called transepts.
Transom, a cross beam forming the horizontal bar of a window in the Gothic or Elizabethan style.
Tread, the horizontal part of a step or stair.
Trelliswork, reticulated or netlike framing, made of thin bars of wood, and generally used as supports for verandas, &c.
Trenail, a wooden pin or nail.
Tressel, a sort of stool used for supporting scaffolding boards. (See *fig* 217.)
Trevises, or *Travises*, partitions.

Triglyphs, certain distinctive marks in the frieze of the Doric order, formed by three glyphs, or grooves.
Trimmed, framed or cut round so as to leave a clear opening.
Trimmed in, a piece of work fitted in between two other pieces previously executed.
Trimmer arches, arches made to support the hearth-stones, abutting at one extremity on the wall of the chimney, and at the other on trimming pieces. (See *fig.* 1213.)
Trimmers, or *trimming pieces*, are pieces of timber framed at right angles to the ends of joists.
Tripoli, a kind of stone used by lapidaries for polishing jewels.
Truncated, cut off.
Trundle, a kind of wheel used in windmills.
Trunks, or tubes of boards for ventilation.
Truss To truss, in carpentry, is to form a system of ties and struts for the support of a roof or weight.
Tumbler lock. The tumbler of a lock is a piece of iron, or other metal, inside the lock, to make the bolt act truly and easily.
Turnpike staircase, a staircase where the stairs wind round a central newel, reaching from the top to the bottom.
Tympanum, the space enclosed by the side and horizontal cornice

U.

Underground braces, cross pieces or braces, sunk into the earth to give firmness to gate-posts. (See *fig.* 888.)
Underpinned sills, sills left hollow between the two points of bearing till the walling is completed, and then filled up; the filling up of the hollow being called underpinning.
Under racks, standard racks, standing on the ground.
Undershot water-wheel, where the water is under the wheel. (See p. 570.)
Union joints, when pipes are connected with double screws.

V.

Valley gutter, a gutter between two roofs.
Vane, a weathercock.
Venetian frame, a frame in three divisions, the two side divisions being narrower than the centre one.
Vents, flues.
Verge slates, end slates.
Verges. Verges are the external edge of the tiling in gables, which are covered with lime and hair, or Roman cement.
Vertical and horizontal bond. Vertical bond is a course of bricks, stone, or other materials, tending to support or strengthen the building vertically; horizontal bond is a similar course, tending to bind or tie together the building horizontally. (See *fig.* 326.)
Vertical windmill, consists of an axis or wind-shaft placed in the direction of the wind, and usually inclining a little upwards from the horizontal line At the end of this are four long arms or sails.
Vestibule, an ante-hall, or lobby, or inner porch.
Volutes, scrolls.
Voussoir, the overhanging part of an arch, looking up from under it.

W.

Wall docks, plugs of wood.
Wall-head tablings, copings bevelled to throw off the rain.
Wall-holed, deeply inserted into a wall.
Wall hooks, pieces of iron, one end of which is fixed in the wall.
Wall plates, horizontal pieces of wood laid on walls to support the rafters.
Wall straps, battens, or pieces of quartering, on which to nail the laths.
Wanes, deficiencies in timber, owing to marking the dimension too near the circumference.
Warpings, bracings.
Washed off, sloped.
Water tables, or weatherings, a species of ledge left upon stone or brick walls, about 18 in. or 20 in. or more from the ground, from which place the thickness of the wall is diminished.
Water-trunks, wooden pipes to conduct the water down. (See *fig.* 60.)
Water verge, a slip nailed on to throw off the rain.
Wattled work, frames filled in with stakes or osier twigs, interlaced in the manner of basket-work.
Ways, the opening to a chimney.
Weather-boarding, feather-edged boards, lapped and nailed on each other, so as to prevent wind or rain passing through.
Weathered, bevelled off, to prevent the snow, &c., from lodging.
Weather tiling, tiles for covering walls. (See *figs.* 392 to 402.)
Welding, the union of two pieces of iron by heating and hammering.
Well holes, the opening left for a staircase.
Well-seasoned timber, timber kept till it is so dry as to be in no danger of shrinking when it is used.
Welsh cornice, two or three protruding courses of brickwork, one of which has dentils formed by the edges of bricks projecting at equal and regular distances.
Welsh lumps, large bricks made of fire-clay.
Wet larder, place where uncooked meat is kept.
Whin stones, broken pieces of granite, or any other stone not freestone.
White deals, deals formed of pine wood, generally of *Pinus Strobus*, in which there is little resin.
Winders, diagonal stairs for corners, where there is no landing-place.
Wind-pinning, filling in the angle between the wall-plate and the roof.
Windlass, wheel and pinion for raising weights.
Window board, a narrow shelf in the interior, at the bottom of the sash. (See *fig.* 73.)
Window dressings, labels, architraves, and other ornaments surrounding windows.
Window frames deal cased, having frames with wooden cases at the back of the pulley styles for the lead weights to hang in.
Window frames properly bedded, having a sufficient quantity of mortar between the frame and the wall to render the frame perfectly secure.
Windows hung folding, casement windows hung to open and shut against each other, as shown in *fig.* 177.
Windsor chair, a wooden chair, the seat of which is of elm, somewhat hollowed out; the outer rail of the back is of one piece, bent in the form of a horse-shoe, by being previously heated or steamed. (See p. 319.)
Wire cloth, very fine lattice-work of wire.
Wire-springs for stuffing mattresses, cushions, &c., are spiral coils of wire, generally the eighth of an inch in diameter.
Wooden bricks, pieces of oak cut to the size and shape of bricks, and built into walls for the purpose of nailing joiners' work to them, when finishing the rooms.
Wyatt's patent slates. Wyatt was architect to George III.; he introduced a new mode of slating with very large thin slates, laid on rafters of much less elevation than any other kind of slating, and with the breadth of the laps much less. Imperial slates are usually employed for this purpose, as they have their lower edges sawn smooth, and have consequently a much neater appearance.

Y.

Yellow deals, deals of fir wood, properly the wild pine, *Pinus sylvestris*, which abound in resin, and are, consequently, more durable than white deals.
York landing, an extra-sized stone laid down before doors, and in the landing-places of stairs.

GENERAL INDEX.

*** *Where the letter* p. *does not occur,* § *is to be understood.*

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